

IN THE UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF DELAWARE

RONALD A. KATZ TECHNOLOGY
LICENSING, L.P.,

Plaintiff,

V.

C.A. No. _____

RELIANT ENERGY, INC.; RELIANT ENERGY
RETAIL SERVICES, LLC; PEPSCO HOLDINGS,
INC.; PHI SERVICE COMPANY; DELMARVA
POWER & LIGHT COMPANY; DUKE ENERGY
CORPORATION; CINERGY CORP.,

Defendants.

DEMAND FOR JURY TRIAL

**APPENDIX OF PATENTS TO PLAINTIFF RONALD A. KATZ
TECHNOLOGY LICENSING, L.P.'S COMPLAINT FOR PATENT INFRINGEMENT**

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Dated: September 1, 2006

TABLE OF PATENTS

<u>UNITED STATES PATENT</u>	<u>EXHIBIT #</u>
U.S. Patent Number 4,792,968.....	1
U.S. Patent Number 4,930,150.....	2
U.S. Patent Number 5,128,984.....	3
U.S. Patent Number 5,251,252.....	4
U.S. Patent Number 5,351,285.....	5
U.S. Patent Number 5,684,863.....	6
U.S. Patent Number 5,815,551.....	7
U.S. Patent Number 5,828,734.....	8
U.S. Patent Number 5,898,762.....	9
U.S. Patent Number 5,917,893.....	10
U.S. Patent Number 5,974,120.....	11
U.S. Patent Number 6,148,065.....	12
U.S. Patent Number 6,335,965.....	13
U.S. Patent Number 6,349,134.....	14

U.S. Patent Number ,424,703.....	15
U.S. Patent Number 6,434,223.....	16
U.S. Patent Number 6,512,415.....	17
U.S. Patent Number 6,678,360.....	18

EXHIBIT 1

United States Patent [19]**Katz**[11] **Patent Number:** **4,792,968**[45] **Date of Patent:** **Dec. 20, 1988**[54] **STATISTICAL ANALYSIS SYSTEM FOR USE WITH PUBLIC COMMUNICATION FACILITY**[75] **Inventor:** **Ronald A. Katz, Los Angeles, Calif.**[73] **Assignee:** **FDR Interactive Technologies, New York, N.Y.**[21] **Appl. No.:** **18,244**[22] **Filed:** **Feb. 24, 1987****Related U.S. Application Data**

[63] Continuation-in-part of Ser. No. 753,299, Jul. 10, 1985, abandoned.

[51] **Int. Cl.⁴** **H04M 11/06**[52] **U.S. Cl.** **379/92; 379/67**[58] **Field of Search** **379/91, 67, 92, 110; 235/377, 375**[56] **References Cited****U.S. PATENT DOCUMENTS**

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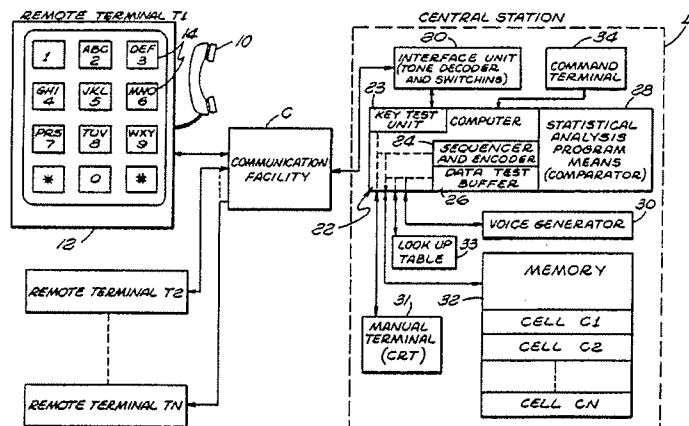
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Primary Examiner—Robert Lev*Attorney, Agent, or Firm*—Nilsson, Robbins, Dalgarn, Berliner, Carson & Wurst[57] **ABSTRACT**

For use with a public communication facility C incorporating terminals T1-TN, e.g. a telephone system, a statistical analysis system D interfaces with individual stations where a caller is prompted by voice instructions to provide digital data that is identified for positive association with the caller and is stored for processing. Caller data is confirmed by a look-up table and by a signal-commanded voice generator. Files are created in the analysis system wherein callers are assigned designations which are stored along with statistical and identification data. In one embodiment, callers are identified by calling sequence and assigned designations are provided in the form of an acknowledgment. A break-off circuit enables a caller to terminate the computer interface aborting to a terminal for direct communication with an operator. The stored data is statistically processed and correlated as with established data to isolate a select group or subset of the callers or caller data that can be readily identified and confirmed.

12 Claims, 4 Drawing Sheets

U.S. Patent

Dec. 20, 1988

Sheet 1 of 4

4,792,968

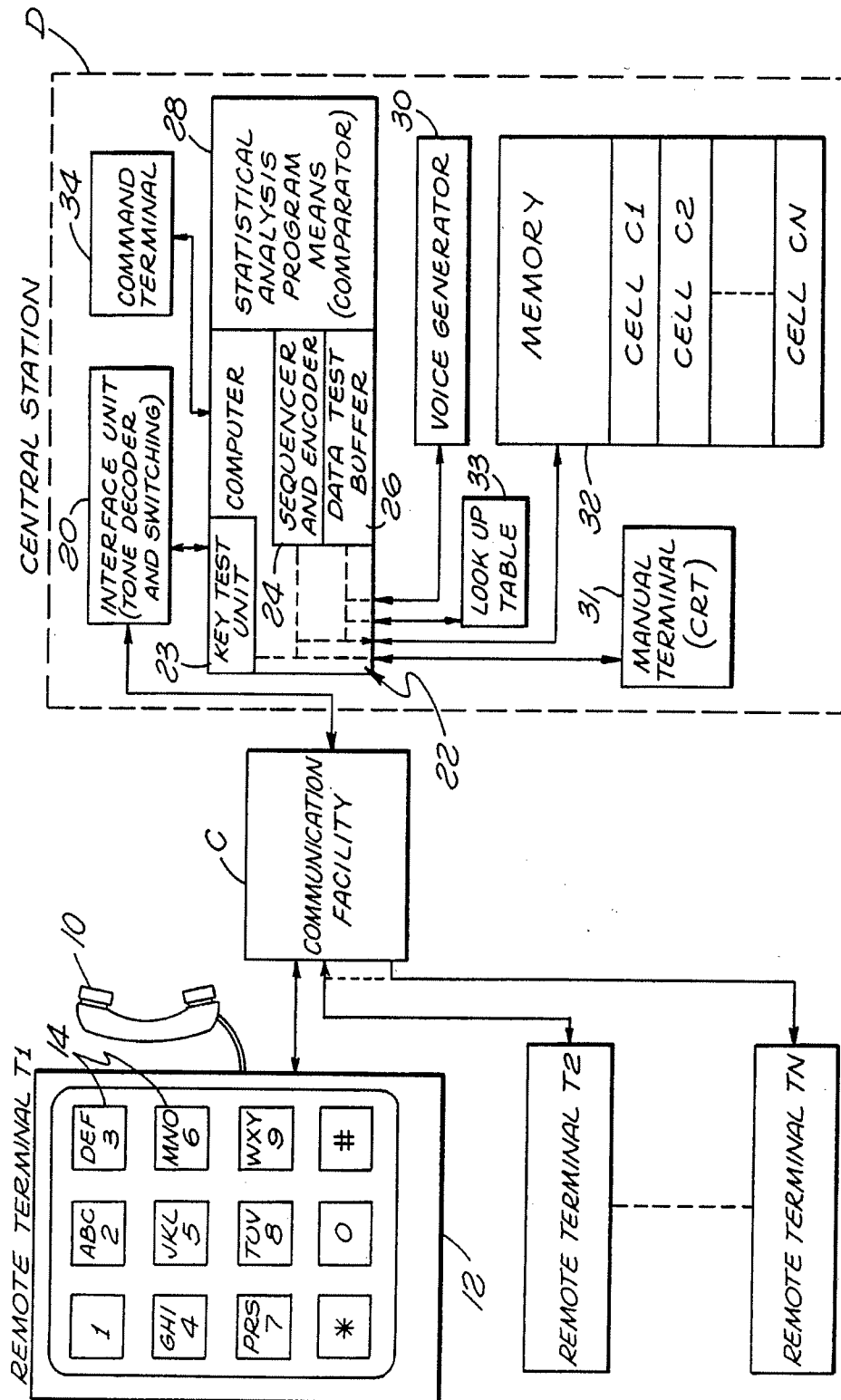


FIG. 1

U.S. Patent

Dec. 20, 1988

Sheet 2 of 4

4,792,968

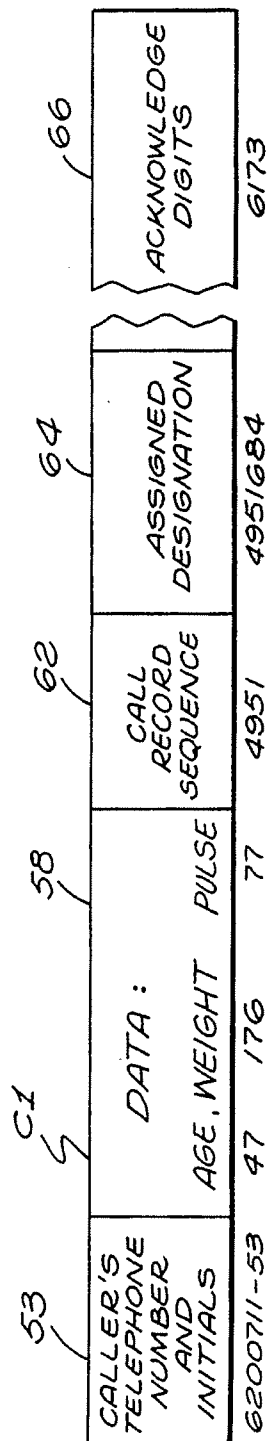


FIG. 2

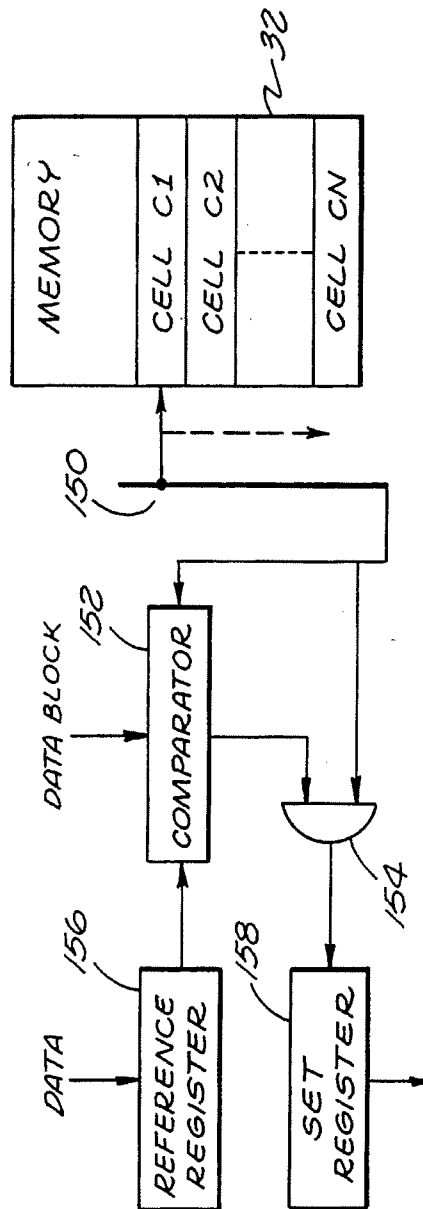


FIG. 6

U.S. Patent

Dec. 20, 1988

Sheet 3 of 4

4,792,968

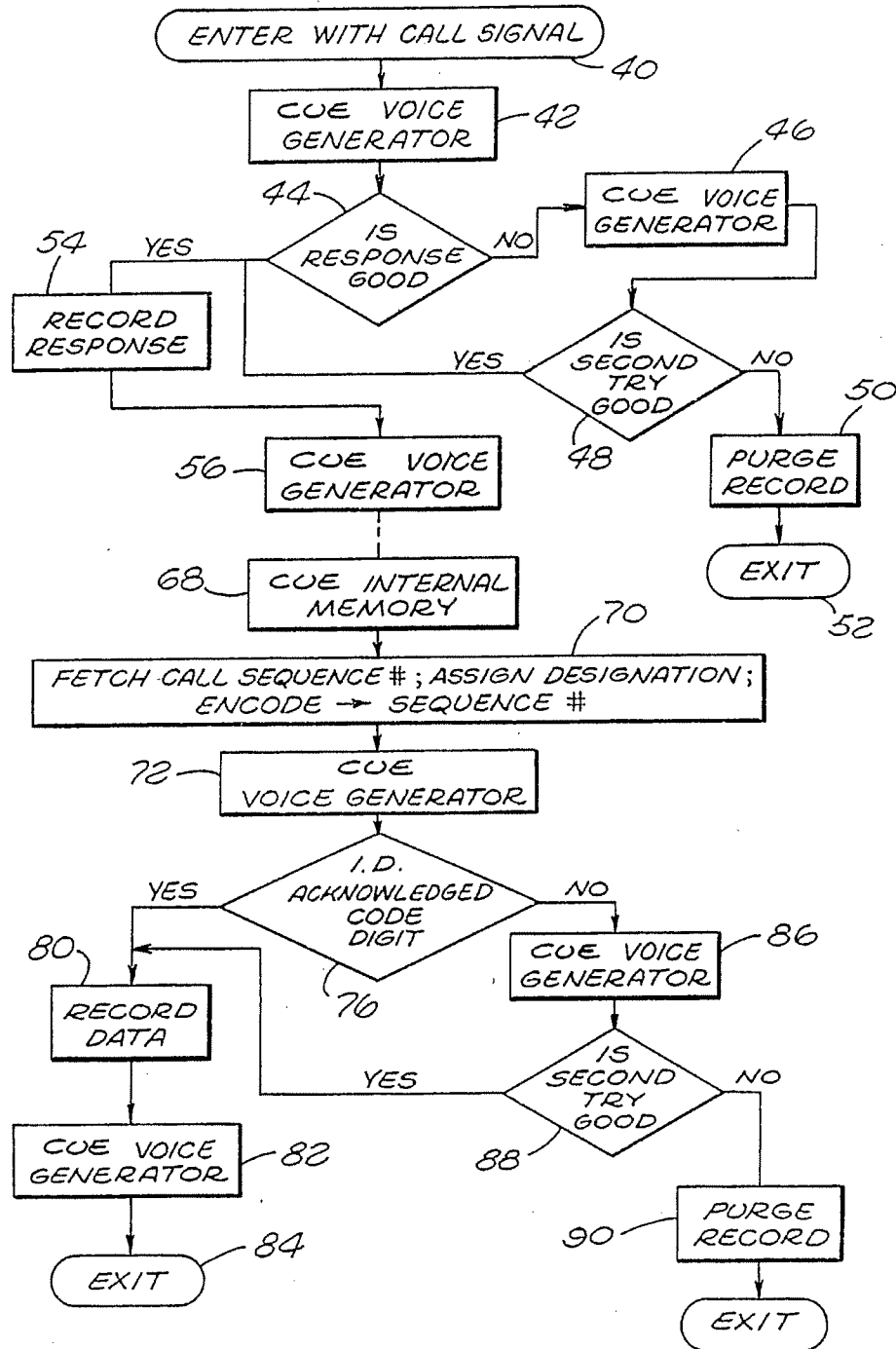


FIG. 3

U.S. Patent

Dec. 20, 1988

Sheet 4 of 4

4,792,968

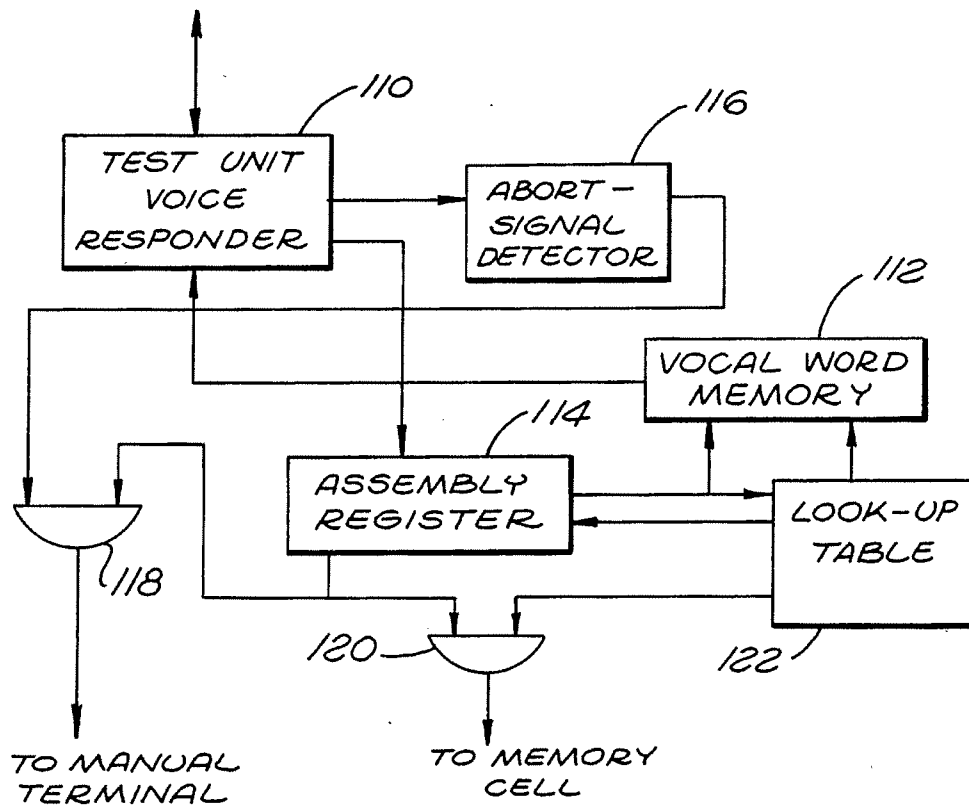


FIG. 4

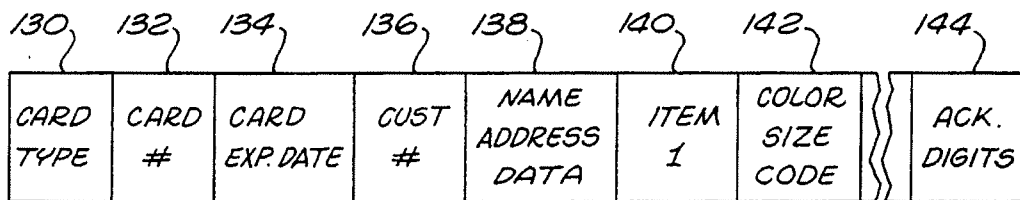


FIG. 5

1

STATISTICAL ANALYSIS SYSTEM FOR USE WITH PUBLIC COMMUNICATION FACILITY

BACKGROUND AND SUMMARY OF THE INVENTION

This is a continuation-in-part of application Ser. No. 753,299 filed July 10, 1985 and entitled "Statistical Analysis System for Use With Public Communication Facility" now abandoned.

Various forms of public polling have come into widespread use. Telecommunications afford a valuable tool for such activity. To some extent, telecommunication polling has been automated, particularly with regard to specific test groups. However, sometimes it is desirable to perform analysis to identify specific selections with respect to very large groups of people who are not preselected for use in an organized calling campaign. For example, it may be desirable to obtain medical data from a large group of people, to correlate such data, then to identify a select subset of the group using some external data. Also, it may be desirable to collect such medical data selectively from people who have purchased a test kit or the like for obtaining data. In any event, a need exists for an effective, economical, and expedient system for performing such analysis and selection.

It has been proposed to use telecommunications systems to interface control systems with individuals who provide digital identification data by actuating a digital mechanism. For example, it has been proposed to interface individuals at telephone calling stations with recorded voice messages prompting the provision of address data by actuating the numeric or alphabetic buttons that are conventionally employed for dialing another telephone station. In general, such techniques have been used to provide specific select information. For example, a caller might actuate dialing buttons to selectively address specific information in a computer of interest to him. In another arrangement, dialing buttons may be actuated to specify a billing designation as for requested services. In the course of such operations, difficulties sometimes arise which are frustrating or confusing to a caller and may ruin the communication. Nevertheless, such techniques offer enhanced possibilities and in general the system of the present invention is based on the recognition of certain of those possibilities.

Telecommunications also have come into widespread use with respect to merchandising. Specifically, for example, most mail-order organizations have telecommunications facilities, some of which may be automated to a limited extent. Television merchandising operations also often involve the supplemental use of the telephone. Accordingly, a need exists to improve telecommunication facilities for such operations with respect to economy, convenience and reliability.

In general, the present invention comprises a system of analysis, selection and data processing for operation in cooperation with a public communication facility, e.g. a telephone system. A voice origination or organization apparatus prompts individual callers to provide select digital data to develop a record for further processing. If appropriate, abort capability allows a caller to interface directly with an operator. A control system may qualify a caller then provide data cells for storing individual data and assigning definitive identifications to such data (and to the caller) and for testing such data, as for the selection of a subset of callers. A variety of

4,792,968

2

memory techniques are used to selectively activate the voice origination apparatus. Accordingly, statistical analysis and selection can be effectively accomplished economically with respect to a substantially unlimited set of callers who are accommodated by a public communication system. In a related aspect, callers can provide data as for merchandising, or various other telecommunications operations involving a large number of persons and a large volume of data.

BRIEF DESCRIPTION OF THE DRAWINGS

In the drawings, which constitute a part of this specification, exemplary embodiments exhibiting various objectives and features hereof are set forth, specifically:

FIG. 1 is a block diagram of a system constructed in accordance with the present invention;

FIG. 2 is a fragmentary diagrammatic representation of a storage cell as may be formatted in the system of FIG. 1;

FIG. 3 is a flow diagram of one operating format of the system of FIG. 1;

FIG. 4 is a block diagram of a form of key test unit as may be employed in the system of FIG. 1;

FIG. 5 is a fragmentary diagrammatic representation of another storage cell as may be formatted in the system of FIG. 1; and

FIG. 6 is a block diagram of a form of analysis means as may be employed in the system of FIG. 1.

DESCRIPTION OF THE ILLUSTRATIVE EMBODIMENT

As required, a detailed illustrative embodiment of the present invention is disclosed herein. However, physical communication systems, data formats, and operating structures in accordance with the present invention may be embodied in a wide variety of forms, some of which may be quite different from those of the disclosed embodiment. Consequently, the specific structural and functional details disclosed herein are merely representative; yet in that regard, they are deemed to afford the best embodiment for purposes of disclosure and to provide a basis for the claims herein which define the scope of the present invention.

Referring initially to FIG. 1, a series of remote terminals T1 through TN are represented (left). The terminals are generally similar, and accordingly, only the terminal T1 is illustrated in detail. In the disclosed embodiment, the remote terminals T1 through TN comprise various telephone terminals coupled to a communication facility C which may take the form of a comprehensive telephone system for interconnecting any associated terminals. The communication facility C is also coupled to a data development central station D in accordance herewith, an embodiment of which is illustrated in some detail.

Generally in accordance with the present development, individual callers use the individual telephone stations T1 through TN to interface the data development station D through the communication facility C. Also in accordance herewith, the data of individual callers is collected and correlated in the data station D for processing in accordance with external data. As a consequence, various objectives are accomplished. For example, a select subset of the callers may be isolated and specifically identified, or related data may be processed, or transactions may be actuated. The possibi-

3

4,792,968

ties are substantial and varied as will be apparent from the exemplary functions as described in detail below.

As indicated, several polling, actuating, marketing or informing operations can be accomplished utilizing systems in accordance herewith. For example, the public might be polled with regard to locating the specific purchasers of a defective and dangerous product. The public might be polled with the objective of locating persons susceptible to a specific ailment or disease. In a less serious vein, but one of particular commercial significance, the system also might be employed in various public communication game formats or, where legal and deemed in the public welfare, public lotteries. The system also might be used to automate a mail-order operation, even to the extent of inventory control as detailed below.

Considering the system of FIG. 1 in somewhat greater detail, it is to be understood that the communication facility C has multiplexing capability for individually coupling the terminals T1-TN to the central station C on request. In the illustrative form of the system, the communication facility C comprises a public telephone facility and the individual terminals T1-TN take various forms of existing telephone instruments. In that regard, the telephone terminal T1 is represented in some detail to include a hand piece 10 (microphone and earphone) and a panel 12 provided with a rectangular array of push buttons 14 in the conventional configuration.

In accordance with conventional telephone designations, alphabetic and numeric designations are provided on the buttons 14. For example, several of the buttons 14 carry three letters along with a decimal numeral. Specifically, the button designated with the numeral "2" also carries the letters "A", "B" and "C". In that manner, the buttons 14 encompass the numerals "0-9", two symbols, and the alphabet except for the letters "Q" and "Z". Consequently, the buttons 14 accommodate entry of decimal data along with a wide range of alphabetic data. In that regard, the buttons 14 designated with symbols "*" and "#" as well as the numeral "0" can be used by predetermined assignment to represent the letters "Q" and "Z" or any of a variety of other data or commands. Generally, in accordance herewith, the buttons 14 are employed to formulate digital data at the central station D in various formats determined by the current specific use and operating format of the system.

Considering the central station D in somewhat greater detail, the communication facility C is coupled to an interface unit 20 which incorporates modems, tone decoders, and switching mechanisms. The interface unit 20 affords couplings to a computer 22 which may take the form of a mini-unit programmed for example in accordance with the functions as set forth below. Generally, the computer 22 performs several distinct and separate operations. Specifically, the computer 22 may initially qualify a caller. In that regard, if a select group of callers are to have access to the system, a portion of the computer 22 designated as a key test unit 23 qualifies individual callers who present a key number. An exemplary detailed embodiment of the key test unit 23 is described below.

With clearance of a caller by the key test unit 23, the system enters a further data acquisition phase with respect to that caller. Specifically, the computer 22 receives detailed data from a caller at any one of the individual stations T1-TN (through the communication facility C) which data is organized, tagged to be identified, and stored. Tests and confirmations may be per-

4

formed during this phase of operation. Thereafter, during a processing phase, the computer 22 processes the stored data. For example, the processing may involve applying additional data to isolate a select subset of callers. Such data may or may not have been available during all or a portion of the data-gathering period.

Sub-blocks of the computer 22, in addition to the test unit 23, also are illustrated in the block designating other components of the computer 22 actually to represent various internal component operating structures. In formulating the data records to be stored, the computer 22 employs logic operations which are performed by a sequencer and encoder 24. During statistical processing operations, the computer 22 utilizes a data test buffer 26 along with a statistical analysis program means 28. Exemplary operations and formats for these elements are treated below.

The computer 22 is connected to a voice generator 30, a manual terminal 31, a memory 32 and a look-up table 33. Note that these components are illustrated separately from the computer 28 for purposes of simplified explanation. The voice generator 30 functions to selectively provide voice messages through the interface unit 20 and the communication facility C to currently active remote terminals. The manual operating terminal 31, located at the central station D, communicates with the computer 22. In the context of the present invention, the manual terminal 31 is activated at a time when it is desirable to abort automated data processing operation as described in detail below. Finally, in the illustrative embodiment, the computer 22 is coupled to the memory 32 containing a plurality of individual cells C1-CN which are employed to register the data from individual callers at the terminals. During data accumulation phases, the apparatus at the central station D acquires data in the memory 32 utilizing individual cells C1-CN for the individual callers. Subsequently, during the statistical processing operation, the computer 22 receives data through a command terminal 34 which is tested with regard to the acquired data in the cells C1-CN of memory 32 so as to select and identify a subset of the individual callers or define action with respect to callers. Thus, the system is effective for use in statistical polling or merchandising to selectively identify a particular subset of data associated with a subset of individual callers and define associated action. In that regard, often it is important to positively identify the isolated subset of callers and also to enable those callers to verify their identity in association with the data. The system of the present invention accommodates those needs.

An appreciation of the philosophical operation of a system in accordance with the present invention may now be enhanced by considering an exemplary operation of the illustrative embodiment of FIG. 1 to isolate a subset of people who are susceptible to a particular disease or infirmity. The exemplary operation might involve a geographical area, as a large city, in which a particular health problem is somewhat acute. For example, a major population center where coronary artery disease is a significant problem might be polled. Accordingly, persons most susceptible to such disease could be identified for corrective recommendations or measures.

As an alternative example related to health, the system may process the resultant data from test kits. Specifically, test kits might be sold to concerned persons who would use the kit to obtain certain specific health

4,792,968

5

data. For example, a person might purchase a kit containing the apparatus and instructions to perform various non-invasive procedures to obtain data that could indicate a health condition, e.g. pregnancy. The kit containing the apparatus could also include a key number for qualifying the purchaser to access the computer 22. The qualification would be performed by the key test unit 23 (described in detail below) which might simply incorporate a look-up table to check off key numbers as they are used or "consumed". With qualification, a caller could be instructed in detail and statistical data could also be acquired.

Returning to the example of generally polling a population center, people of the metropolitan area could be informed of the availability of a service for statistical health analysis. Accordingly, persons interested in their individual statistical situation would be motivated to utilize the service. Specifically, individual callers would use the remote terminals T1-TN to contact the central station D through the communication facility C and thereby provide personal information which would enable a statistical analysis in relation to existing data so as to isolate and inform those persons statistically most likely to be in need of corrective measures. In such applications, it may be important that the caller's identity be subject to reliable verification. Other applications also may present a critical need for positively verifiable identification to the extent that credit card numbers and/or personal identification numbers may be employed.

An exemplary operation of the system, with regard to a specific caller, will now be treated referring somewhat concurrently to FIGS. 1, 2 and 3. As indicated above, FIG. 2 indicates a data storage format and now will be considered with regard to a format in which data is composed for a caller in one of the cells C1-CN of the memory 32.

Pursuing the above example in accordance with the assumptions, further assume the existence of a caller at the remote terminal T1 who wishes to pursue health-related information on the basis of statistical analysis. The caller lifts the hand piece 10 and in accordance with conventional techniques actuates the push buttons 14 to establish communication through the facility C with the central station D. Upon receiving the call signal, the interface unit 20 (central station D, FIG. 1) actuates the computer 22 to cue the voice generator 30. The sequence of operations is represented to be initiated in FIG. 3 by the "enter" block 40 which is accordingly followed by a "cue voice generator" command block 42. Accordingly, the voice generator 30 (FIG. 1) formulates speech, a representative form of which might be: "Thank you for participating in the coronary artery disease statistical analysis. Please give us your telephone number by actuating the call buttons on your telephone instrument."

Acting on the instructions the caller would push the buttons 14 in sequence to indicate his telephone number, e.g. "6200711". This data could be taken directly from the system as it is available in certain telephone apparatus of the facility C. The time of day also could be taken. The resulting data signals are communicated to the interface unit 20 (FIG. 1) then applied to the computer 22 for testing as a valid telephone number. Note that the number can be tested by the look-up table 33 (FIG. 1) as separately illustrated. Essentially, the format of a proper number prompts the look-up table to produce a valid or "good" signal. The test is indicated by the

6

block 44 (FIG. 3). If the response is not valid, for example contains an inappropriate number of digits, the operation of block 46 is initiated again cuing the voice generator 30 (FIG. 1). Accordingly, the voice generator reinstructs the caller, e.g.: "You have not entered a proper telephone number. Please reenter your telephone number by pressing the appropriate call buttons."

The caller is then allotted a predetermined period of time to make a proper entry with the consequence that the system move to a test operation as indicated by the block 48 (FIG. 3). Specifically, block 48 poses the query: "Is the second try good?"

If the caller is again unsuccessful, the system purges the record as indicated by the block 50 and the call is terminated as indicated by the block 52. In an alternative mode, the computer 22 may abort the interface and couple the manual terminal 31 for communication with the caller. The interchange would then proceed, person-to-person.

If the caller responds with a proper telephone number, the operation proceeds. Specifically, the system sequences to record the response of the proper telephone number as indicated by the block 54. That is, the caller's telephone is recorded in a specific cell C1-CN identified with the caller. The format of the cell C1 is indicated in FIG. 2. The first portion, section 53, contains the caller's telephone number, i.e. "6200711". Note that as explained above, if the second attempt to formulate a proper number is successful, as manifest by the block 48 (FIG. 3), the response is recorded at that stage. In either case, exiting from the block 54 (FIG. 3) invokes the next operation of again cuing the voice generator as indicated by the block 56.

As an alternative, if a selective-group polling operation is performed, as mentioned above, the caller is qualified by providing the "one-time" key number included in his package. As indicated above, the unit 23 may incorporate a look-up table for proper key numbers. Proper numbers may be coded using any of a wide variety of techniques. As a simple illustrative example, the key may comprise a precise number of digits that always total a particular numerical value.

The key test unit 23 performs the test as an initial qualification. Next, the unit 23 verifies that the key given by a caller has not been consumed by prior use. Thus, the unit 23 may simply incorporate some arithmetic test capability along with a look-up table as well known in the art.

Returning to the detailed example, the system proceeds after the caller is qualified. Specifically, the cue to the voice generator 30 (FIG. 1) as represented by the block 56 produces a request for further information from the caller. For example, the voice generator might request information by stating: "Please use the telephone buttons to indicate the initials of your first and last names using the asterisk button for the letters Q and Z."

The detailed operation is not represented in FIG. 3 as it is similar to the operation illustrated by the blocks 42 through 54. However, again, a proper response is registered in the storage cell C1 as illustrated in FIG. 2 by the number "53" also registered in the first section 53 of the cell.

The cycle of obtaining digital information from the caller next is repeated with respect to substantial specific health data. For example, as illustrated in FIG. 2, the next section 58 in the cell C1 receives an accumula-

7

tion of health data, including the caller's age, weight, . . . , pulse rate, and so on. Representative digital numbers are illustrated in FIG. 2.

During the course of the telephonic communication, the computer 22 formulates identification data for the caller specifically including: the chronological sequence of the call, the assigned designation of the call, and a set of acknowledgment digits for the call. Such data identification is registered in the assigned cell C1 in accordance with the format of FIG. 2 being stored in sections 62, 64 and 66. Note that the data may be stored in a coded interrelationship. For example, the acknowledgment digits may be related to the call record sequence. In the illustrative example, the chronological order number of the caller is 4951. The acknowledgment digits may be derived from the sequence number. For example, as illustrated, a coded relationship may be established by adding "two" to each of the individual record sequence digits. Considering the example numerically:

$$\begin{array}{r} 4951 \\ 2222 \\ \hline \text{Adding without carries: } 6173 \end{array}$$

According to the example, the call chronological sequence registered for the caller is 4951 as represented in the section 62 while the acknowledge digits are 6173 as registered in the section 66. Additionally, the computer develops an assigned designation number, e.g. designation "4951684", which is registered in the section 64 and an acknowledgment code or digits, e.g. 6173, registered in the section 66. These values are formulated in accordance with conventional number techniques during the data acquisition phase. Specifically, with the exemplary numerals formulated, the operation proceeds.

The computer 22 (FIG. 1) cues the internal memory. That operation is indicated by the block 68 (FIG. 3). Thus, the computer 22 fetches the call record sequence number, assigns a designation (if not previously assigned), and encodes the sequence number as the acknowledgment digits (if not previously accomplished). These operations are indicated by the block 70 (FIG. 3). Next, the computer 22 (FIG. 1) cues the voice generator as indicated by the block 72 (FIG. 3) to provide information to the caller. Specifically, for example, the voice generator 30 (FIG. 1) might state: "This transaction has been designated by the number 4951684, and is further identified by the acknowledgment digits 6173. Please make a record of these numbers as they will be repeated. Specifically, the designation number is 4951684. The acknowledgment digits are 6173. Please acknowledge this transaction by pressing your telephone buttons to indicate the acknowledge digits 6173." In various applications as those involving security, the order and acknowledgment of callers may be very important. Therefore, data for confirmation associated with the order is important.

The system next assumes a test mode as indicated by the block 76 (FIG. 3). If the caller provides the correct acknowledgment digits, the data is confirmed in the record as indicated by the block 80 and registered in the cell C1 (FIG. 2). Additionally, the voice generator 30 (FIG. 1) is sequenced as indicated by the block 82 (FIG. 3) to indicate the close of the communication and that

4,792,968

8

the transaction is terminated as represented by the exit block 84.

In the event that the caller cannot confirm his acknowledgment digits, as indicated by the block 76, a repeat operation is performed as indicated respectively by the blocks 86 and 88. Specifically, the voice generator 30 (FIG. 1) is cued for a second instructional message. In the event that the second attempt also fails, the data is purged and the call discounted as indicated by block 90. If the second try is successful (test block 88), as indicated by the block 80, the record is perfected as indicated above.

As a result of the likelihood of a large number of calls, as described above, the data cells C1-CN in the memory 32 (FIG. 1) are developed with specific information indicative of a statistical sampling of the populace of concern. The data of that statistical sampling may be self-generating of specific conclusions with respect to a subset of individuals, and/or supplemental data may clearly manifest a significant subset. For example, the data may indicate a significant departure from an assumed normal characteristic. Such data, accumulated from the polling, may be considered by logic comparisons in the computer 22 to select the subset of persons who should be isolated.

In addition to the self-generating conclusions available from the received data, the system may involve the introduction of external data. In the physical fitness example, such external data might take the form of national statistical data. In any event, the processing operation usually involves comparison testing which compares caller data from individual cells C1-CN with test data that is supplied to the statistical analysis program means 28 through the command terminal 34.

As a simplistic example, health data including age, weight, . . . pulse, may be formulated into a composite number reflecting rated values for each of the data elements. Such a composite number may then be placed in the data test buffer 26 for sequential testing against similarly composed numbers formed from the data in the individual cells C1-CN. Based on such comparative testing, a subset of persons may be identified. Presumably those persons will be informed of their circumstances. Note that the command terminal 34 incorporates a display or other output data apparatus as standard in the art for manifesting the subset. However, it is important that identifications be confirmed as accurate. It is in that sense that the assigned designations as registered in the section 64 (FIG. 2) and the call record sequence, as registered in the block 62, are important. Note that multiple comparative processing operations may be desirable or necessary to isolate and confirm a subset of significant concern.

In the above example, members of the public were simply invited to use the service. A number of alternatives exist which might well impact on the statistical analysis. For example, callers might be restricted to the purchasers of a specific product as a medical apparatus for measuring blood pressures, heart rates, or so on. In such situations, it will be apparent that the statistical data will be somewhat distorted from an average or normal sampling. Clearly, the computer 22 can be programmed to take into account such considerations. In that regard, the computer 22 might also verify identification data proffered by a caller. Such data might take the form of a credit card number or a personal identification number. Various techniques for verification of

4,792,968

9

such numbers using computer techniques are well known and recognized in the prior art.

As indicated above, the system can be formatted for use in a variety of applications, including the automation of a mail order operation. Preliminary to considering an exemplary form of such an application, a disclosed embodiment of the key test unit 23 will be considered as illustrated in FIG. 4. A test unit voice responder 110 (FIG. 4, upper left) is coupled to the interface unit 20 (FIG. 1). The voice responder 110 may be integrated with the voice generator 30 (FIG. 1), or take the form of a separate unit. In any event, the responder functions as a channel or conduit for signals passing in and out of the unit and on command forms modulated voice signals to enunciate words in accordance with signals from a vocal word memory 112.

As a signal channel, the responder supplies received signals to an assembly register 114 and to an abort signal detector 116. The abort signal detector 116 may simply take the form of a decoder that is actuated to produce an abort signal on receiving a digital signal to manifest a specific binary code, e.g. the code word representative of the asterisk button (*) on the panel 12 (FIG. 1). From the detector 116 (FIG. 4) the abort signal is applied to an "and" gate 118.

As indicated above, signals received by the responder are applied to the assembly register 114. Signal data received by the register 114 is compiled. The data includes the preliminary information for a caller. That information is supplemented with additional data to complete a memory cell word as illustrated in FIG. 5.

The register 114 is connected to supply its contents to the "and" gate 118 as well as a similar "and" gate 120. Functionally, the gates 118 and 120 pass the contents of the assembly register 114 at the time when a qualifying signal is received. The gate 118 is qualified by the abort signal from the detector 116 and the gate 120 is qualified by a signal from a look-up table 122.

Essentially, the look-up table 122 is indexed and addressed by the identification numbers of callers and responds with approval signals for the callers, if appropriate. The look-up table is also connected to supply disapproval signals to the vocal word memory 112, so that the memory 122 also is coupled to receive addressing signals from the register 114.

Consider now the operation of the system of FIG. 1, with the key test unit 23 as illustrated in FIG. 4 and with a system format to automate a mail order operation and assemble data in cells of the memory 32 as illustrated in FIG. 5. Accordingly, assume that a caller establishes communication with the system as explained above.

As an initial preliminary action, the voice responder 110 might be cued to identify the mail order house and indicate that the order will be taken by computer. The caller also might be advised that if he prefers to communicate directly with a person, or needs such contact at any point in the communication, he may accomplish it simply by pushing the asterisk button (*) on his telephone. Alternatively, the customer may be asked by the voice generator 30 to provide (by voice) longer information as name, address, etc. which is recorded for later processing. Such action forms an abort signal that is detected by the detector 116 to qualify the gate 118. As a result, the contents of the register is passed to the manual terminal 31 (FIG. 1) with the command to take over the communication. If preliminary data has been assembled in the register 114, such data will be dis-

10

played by a CRT of the terminal 31 to facilitate further communication.

After the preliminary information is supplied to a caller, the data collection phase is initiated. For example, the voice responder 110 might announce: "Please indicate the type of credit card you will use for your purchase by pushing the button number one for Mastercharge, two for . . ."

The caller's response, indicating a specific credit card, is stored in the register 114, specifically in the first data block 130 as illustrated in FIG. 5. The responder next instructs the caller to use the telephone buttons to indicate his credit card number and the expiration date of the card. That data is stored in the register 114, specifically in the blocks 132 and 134 as illustrated in FIG. 5. Similarly, in the disclosed embodiment, the caller is asked for his customer number, as it may appear on his catalog. That number is stored in a block 136 of the register 114. Note that the caller may not be in the files of the mail order house and in that event, the operation may be shifted to a manual operation to be continued through the manual terminal 31 as explained above. For a television initiated mail order transaction, other numerical codes might be employed as to key into broadcast schedules. For example, a code might be used to indicate program times and thereby enable evaluation of the productivity of such program times.

To continue with the explanation of the automated format, assume that the customer has a number and that it is stored in the assembly register 114 along with his credit card number and expiration date. From that location, the data is checked for propriety as part of the initial test operation. The check or test is in two stages. First, the data is verified to be accurately registered by confirming it with the caller. Second, the data is verified as representing valid and proper data formats for the customer's number, the credit card number and expiration date. The test may also include a step of consulting a so-called negative list to assure that the identified card and customer's number have not been cancelled, as for example in the case of credit cards that have been lost or stolen.

To accomplish the first stage of verification, under control of the computer, the vocal word memory 122 is prompted to actuate the responder 110 to announce the registered data including the card number. Specifically for example, the memory 112 is addressed by the digits of the card number as stored in the register 114. Accordingly, the memory 112 supplies modulated voice signals to the responder 110. The mechanically stated message might be in a fixed format except for the card number, for example: "Please verify your card number as it will now be repeated. If the number is 2745273845957, please push the one button."

If incorrect numbers are stored in the register 114, a corrective cycle may be sequenced as explained with respect to the first operating format. Also as explained above, with repeat failures, the communication may be terminated or the system may shift to a manual format by activating the terminal 31 (FIG. 1) attended by an operator.

If the customer's number, card number and the expiration date are verified by the caller as correctly recorded in the register 114 (FIG. 4), the operating sequence proceeds. Accordingly, the system proceeds with the next phase of the test and checks the current propriety of the data in the register 114. Under control of the sequencer 34 (FIG. 1) the card type, number and

4,792,968

11

expiration date, along with the customer's number as contained in the register 114 (FIG. 4) are supplied to the look-up table 122 for approval. A variety of different checks may be implemented in the table, depending on the nature of the system. In a minimal system, the table 122 verifies the propriety of the data simply as to form. In a more complex embodiment, the structure of the table 122 may include a negative list of unacceptable cards and customer's numbers. For still greater control, the structure of the table 122 might incorporate a memory for scoring transactions of individual card holders as with reference to time. Various structures and formats for such operations are well known in the credit verification and approval art.

In the disclosed embodiment, the look-up table 122 carries the full names and addresses of the customers. Accordingly, in response to the customer's number, the look-up table operates through the vocal word memory to activate the voice responder. Specifically for example, the responder might be activated to state: "Please confirm that your full name is John J. Jones by pressing the one button." Similarly, the address and any other pertinent mailing information is confirmed. With confirmation, the data is stored in the register 114. Specifically, a block 138 (FIG. 5) of the register 114 (FIG. 1) receives the name and address data. Of course as explained above, difficulties might prompt either manual interface or termination of the communication.

With the successful completion and verification of all the preliminary data in the register 114, the look-up table qualifies the "and" gate 120 transferring the contents of the register 114 (FIG. 4) to a data cell in the memory 32 (FIG. 1). Essentially, with the caller testing complete, the preliminary phase of operation is concluded and the system next interfaces with the caller to acquire and process data for a specific order of merchandise. That operation is performed by the structural components as illustrated in FIG. 1 to load a cell in the memory 32.

Somewhat as described above in relation to the initial operating embodiment, the voice generator 30 prompts the caller through a series of exchanges that load the memory cell with a merchandise order. For example, the interchange might be as follows. The voice generator might instruct: "Please use the telephone number button to enter the item number of your purchase."

The caller might then enter the number "1124" which would be set in the data test buffer 26 and supplied to address the look-up table 33. In response, the look-up table 33 would cue the voice generator 30 to announce: "That is item number 1124, a small white men's polo slipover cotton shirt at \$11.95. If that is correct, please push the button one on your telephone. If it is not correct, push the button two and re-enter the item number."

The caller could confirm or reject the item. As items are confirmed, they are loaded from the buffer 26 to the designated cell in the memory 32. With the registration of an item in the memory 32, the caller is asked to indicate whether or not he wishes to order additional items. Accordingly, the cycle may be repeated. Of course, as explained above, at any stage the customer can abort the mechanical interface and establish personal communication with an operator at the terminal 31. Also, some operating formats might automatically make the shift, as where the callers are all strange to the system and complex data must be registered as names and addresses.

12

As purchase items are confirmed, representative data is loaded into the assigned cell of the memory 32 as illustrated in FIG. 5. Specifically, a series of storage blocks are loaded as exemplified by the blocks 140 and 142. The interchange continues until the customer indicates he does not wish to order any additional items. The system then operates the voice generator 30 to announce the acknowledgement digits as stored in the block 144 (FIG. 5) of the assigned data cell in the memory 32 (FIG. 1). The acknowledgement digits serve to identify the order both for the caller and the mail order house. Accordingly, tracing is facilitated.

The individual cells of the memory 32 are processed to originate filling orders. In that regard, the statistical analysis program means 28 accumulates totals of specific items which are then utilized for inventory control. Specifically, comparisons can be performed between order totals, objective and existing inventories to generate lists for inventory adjustment. Thus, the system effectively analyzes acquired data to accomplish the desired objectives. To consider such analysis in somewhat greater detail, reference will now be made to the block diagram of FIG. 6.

FIG. 6 functionally illustrates a component of the analysis means 28 (FIG. 1) specifically for processing data to develop a related set. Generating a data set or subset with respect to any particular polling or data accumulation operation can be very significant. For example, in a polling operation it may be desirable to isolate specific sets or subsets of persons or subjects falling into a specific category as explained above. With respect to merchandising operations, it may be desirable to isolate sets of files either for inventory control purposes, order processing or in the interests of avoiding fraud. Some examples will illustrate the functions.

In a mail order operation, shipments often can be expedited by providing lists of similar items that are to be shipped. Accordingly, it is desirable to isolate a subset of orders on the basis of the items ordered, for example as specified in block 140 of the storage cell of FIG. 5. The same information is useful for inventory control. For example, after isolating a subset of orders or a specific article, the number of articles may be tallied to indicate inventory depletion.

As indicated above, isolating subsets of order data also may be helpful in avoiding fraud. Consider a likely gang operation. With an intention to defraud, a number of illicit credit cards may be acquired. Specifically, for example, the cards may have recently been stolen with the consequence that they likely can be used for a short period of time. A potentially profitable use of the cards would be to support the purchase of a large volume of merchandise from a mail order establishment. Normally such an operation would involve readily marketable merchandise.

In the fraudulent use of the illicit cards, data falls into three categories. First, the card itself specifies certain data. Second, certain data involves the order; and third, data is provided to indicate the shipping destination for the merchandise. In a gang operation, a common shipping destination may be employed for a short period. Consequently, a major subset of merchandise order data designating a similar destination for merchandise should prompt suspicion. If the subset further indicates relatively marketable merchandise, further suspicion is aroused. Of course, at some point an investigation is desirable prior to delivering the merchandise. Accord-

4,792,968

13

ingly, it is important to assemble a data subset wherein the block 138 (FIG. 5) specifies similar data.

Similarly, a sizable subset indicating multiple orders on the same credit card (block 132) may also suggest the need for investigation. Reference will now be made to FIG. 6 indicating a symbolic arrangement for acquiring or defining subsets of data during the course of the processing operation.

As illustrated in FIG. 6, the memory 32 is illustrated in FIG. 6 with the multiplicity of cells. The cells may be sensed by a scanner 150 illustrated for purposes of explanation as a mechanical apparatus. Of course, the system of the analysis means 88 (FIG. 1) would incorporate solid state operation to accomplish the function of the scanner 150. In any event, the scanner 150 sequentially receives the contents of cells C1 through CN for providing representative signals to a comparator 152 and an "and" gate 154. The comparator 152 also receives signals from a reference register 156 which is in turn connected to receive signals from within the computer 22, e.g. from the buffer 26. The comparator 152 also receives a command signal in the form of a specified data block to indicate the portion of cell data units to be compared.

The output of the comparator 152, a binary signal in a high state in the event of a comparison, qualifies the gate 154 to pass the contents of a cell to a set register 158. Consider an exemplary operation.

Assume, for example, that it is desired to test the data in each of the cells C1 through CN with respect to specific health data. The reference health data would be set in the reference register 156 from any of the sources within the computer 22. The comparator 152 would receive a test instruction for the digits in the data block 52 (FIG. 2) reflecting the health data. The system would then be commanded to proceed, and data from individual cells C1 through CN would be supplied through the scanner 150 to the comparator 152. Upon the occurrence of a coincidence, the comparator 152 would qualify the "and" gate 154 to pass the data cell contents to the set register 158. At the termination of the operation, the subset of data from the cells C1 through CN having the specified similarity would be contained in the set register 158. Accordingly, such data could be further processed as suggested above within the analysis means 128.

To consider another exemplary operation, assume the system of the present invention is embodied for a mail order facility and concern exists with respect to a volume of orders supported by illicit credit cards and destined for a "drop" address. In such an instance, the contents of the data block 138 (name and address data) as illustrated in FIG. 5 would be of concern. Accordingly, the comparator 152 would be set to test the contents of data block 138. Next, the contents of cells C1 through CN would be sequentially applied to the reference register 158 and the comparator 152. Upon detecting a coincidence between a pair of cells with respect to the data block 138, one of the cells would be held in the reference register 156 to scan through the remainder of the cells C1 through CN and thereby accumulate a subset of data in the register 158 indicating a similar destination address for merchandise. With review, determinations could then be made either within the analysis means 28 or by a manual observation as to whether or not investigation appeared appropriate.

A wide variety of other possibilities, applications and formats in accordance herewith will be apparent to

14

those skilled in the art wherein data is assembled, stored, identified, processed by testing as to isolate a subset or manifest data with sources reliably confirmed. With respect to identification data, it may be an identification such as a credit or identification card number, driver's license number, telephone number, etc. Alternatively, identification data may be a combination of identification-related data such as, for example, credit card number, merchant identification, expiration date of credit card and amount of transaction. For example, merchandising, polling, selecting and related operations are practical.

In view of the above explanation of the exemplary system, it will be appreciated that embodiments of the present invention may be employed in many applications to accumulate statistical data, process such data, and define subsets of callers of concern. While certain exemplary operations have been stated herein, and certain detailed structures have been disclosed, the appropriate scope hereof is deemed to be in accordance with the claims as set forth below.

What is claimed is:

1. A statistical analysis process for data from remote sources and for use with a communication facility including remote terminal apparatus for individual callers, wherein said remote terminal apparatus may comprise a conventional telephone instrument including voice communication means and digital input means in the form of an array of alphabetic numeric buttons for providing data, said process including the steps of:

interfacing said communication facility to provide voice signals and receive digital identification and answer signals representative respectively of identification data and answer data developed by said terminal apparatus under control of a caller;

generating voice signals and supplying said voice signals to actuate said terminal apparatus, as to provide vocal operating instructions to a caller;

providing sequence signals representative of sequence data indicating the time sequence of a call with reference to each of the calls from other callers;

initiating files and storing, (1) answer data for specific callers as indicated by said digital answer signals, (2) sequence data as indicated by said sequence signals and (3) identification data as indicated by identification signals identifying callers;

providing external data signals representative of external data distinct from answer data provided from said callers; and

comparing said answer data from said callers and analyzing said answer data with said external data in combination to isolate a select subset of said callers.

2. A process according to claim 1 including the further step of generating acknowledgement data for a call and storing said acknowledgement data as further identification data.

3. A process according to claim 2 including the further step of encrypting at least part of said acknowledgement data prior to storing.

4. A process according to claim 2 including the further step of communicating at least part of said acknowledgement data to a caller.

5. A process according to claim 1 including the further step of receiving a caller's telephone number as identification data.

4,792,968

15

6. A process according to claim 1 including the further step of generating further identification data to provide a plurality of distinct data elements for identifying a caller.

7. A process according to claim 1 including the further step of testing identification data of a caller as a condition to storing answer data.

8. A process according to claim 7 including the further step of maintaining a record of callers to restrict the extent of answer data stored for a caller.

16

9. A process according to claim 8 including the further step of limiting the answer data stored from a caller to a one-time entry from a single call.

10. A process according to claim 7 including the further step of limiting the use of the process to store data from individual callers during a specific interval of time.

11. A process according to claim 1 including the further step of storing a billing identification number as at least part of said identification data for a caller.

12. A process according to claim 1 including the further step of aborting the interfacing step on command of a caller by a specific answer signal to provide person-to-person communication.

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EXHIBIT 2

United States Patent [19]

Katz

[11] Patent Number: **4,930,150**[45] Date of Patent: * **May 29, 1990**[54] **TELEPHONIC INTERFACE CONTROL SYSTEM**[75] Inventor: **Ronald A. Katz, Los Angeles, Calif.**[73] Assignee: **First Data Resources Inc., Omaha, Nebr.**

[*] Notice: The portion of the term of this patent subsequent to Dec. 20, 2005 has been disclaimed.

[21] Appl. No.: **260,104**[22] Filed: **Oct. 20, 1988****Related U.S. Application Data**

[63] Continuation-in-part of Ser. No. 18,244, Feb. 24, 1987, Pat. No. 4,792,968, which is a continuation-in-part of Ser. No. 753,299, Jul. 10, 1985, abandoned.

[51] Int. Cl.⁵ **H04M 11/06**[52] U.S. Cl. **379/93; 379/92; 379/67**[58] Field of Search **379/92, 93, 91, 67**[56] **References Cited****U.S. PATENT DOCUMENTS**

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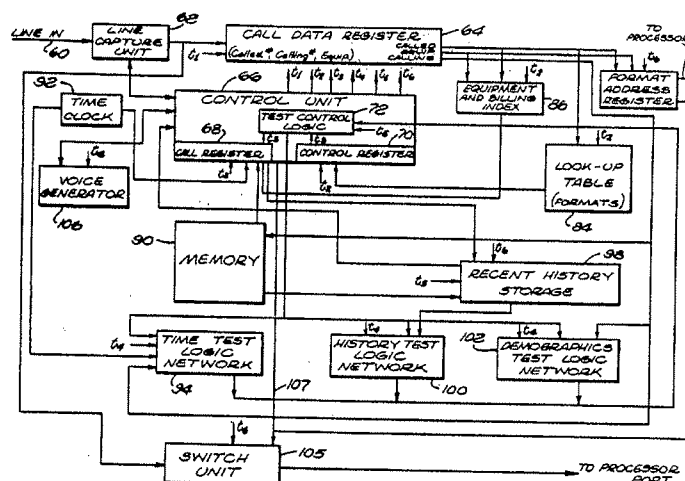
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Primary Examiner—Robert Lev
Attorney, Agent, or Firm—Nilsson, Robbins, Dalgarn, Berliner, Carson & Wurst

[57] **ABSTRACT**

Call data signals actuated by a telephone terminal are provided from a telephone communication system to indicate call data as the called number, the calling number and the calling equipment. The call data signals address related control functions for interfacing a multiple-format multiple-port data processing system. Screening tests and format selection for the processing system are performed. Individual telephone terminals and individual data formats are interfaced under controlled conditions specified by the call data. Time tests, history tests and demographic tests are executed in addition to basic qualification tests. Control is executed from active data storage for assembled control words and record words. Record words for individual calls are stored along with developed billing data.

19 Claims, 5 Drawing Sheets

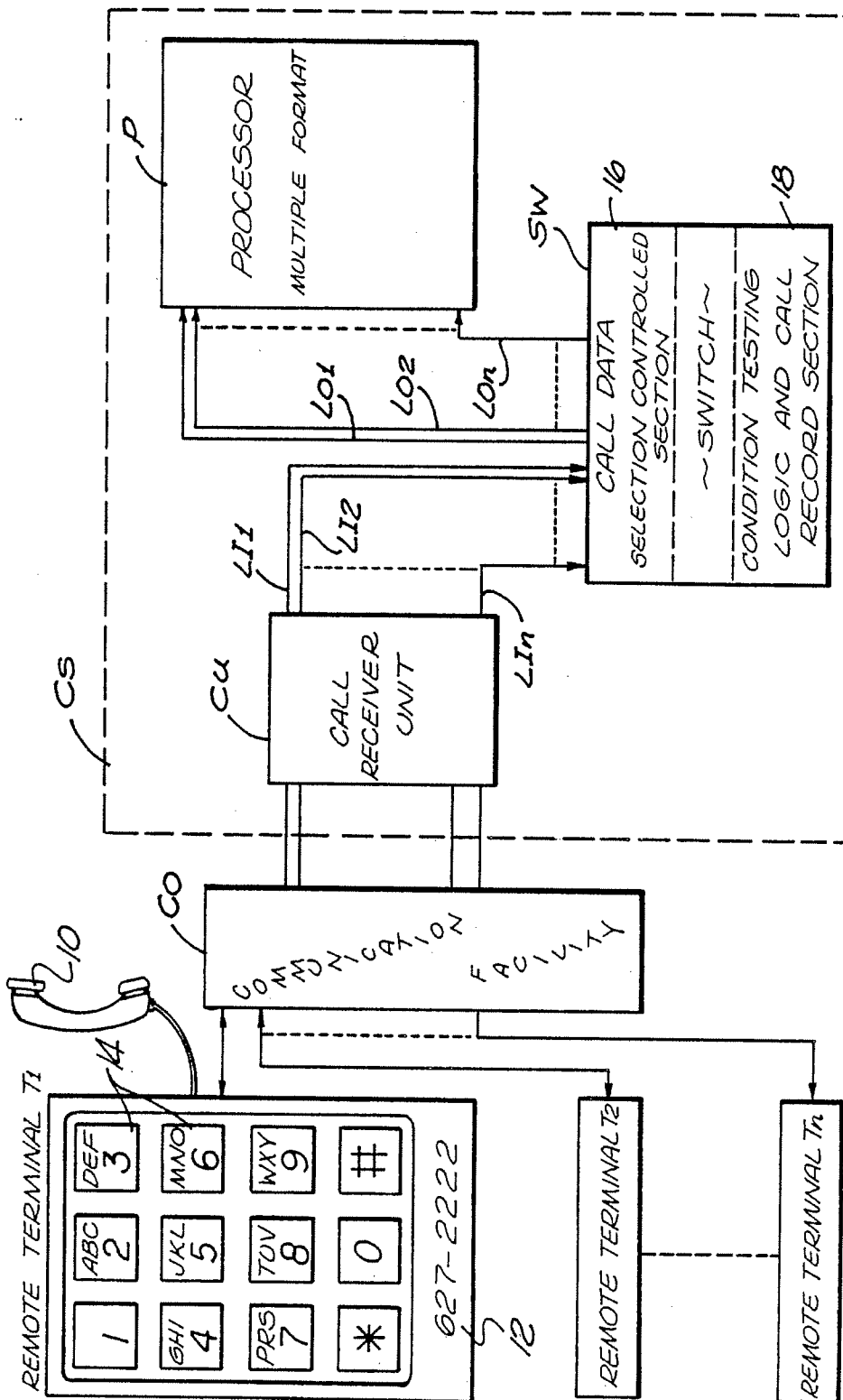


FIG. 1

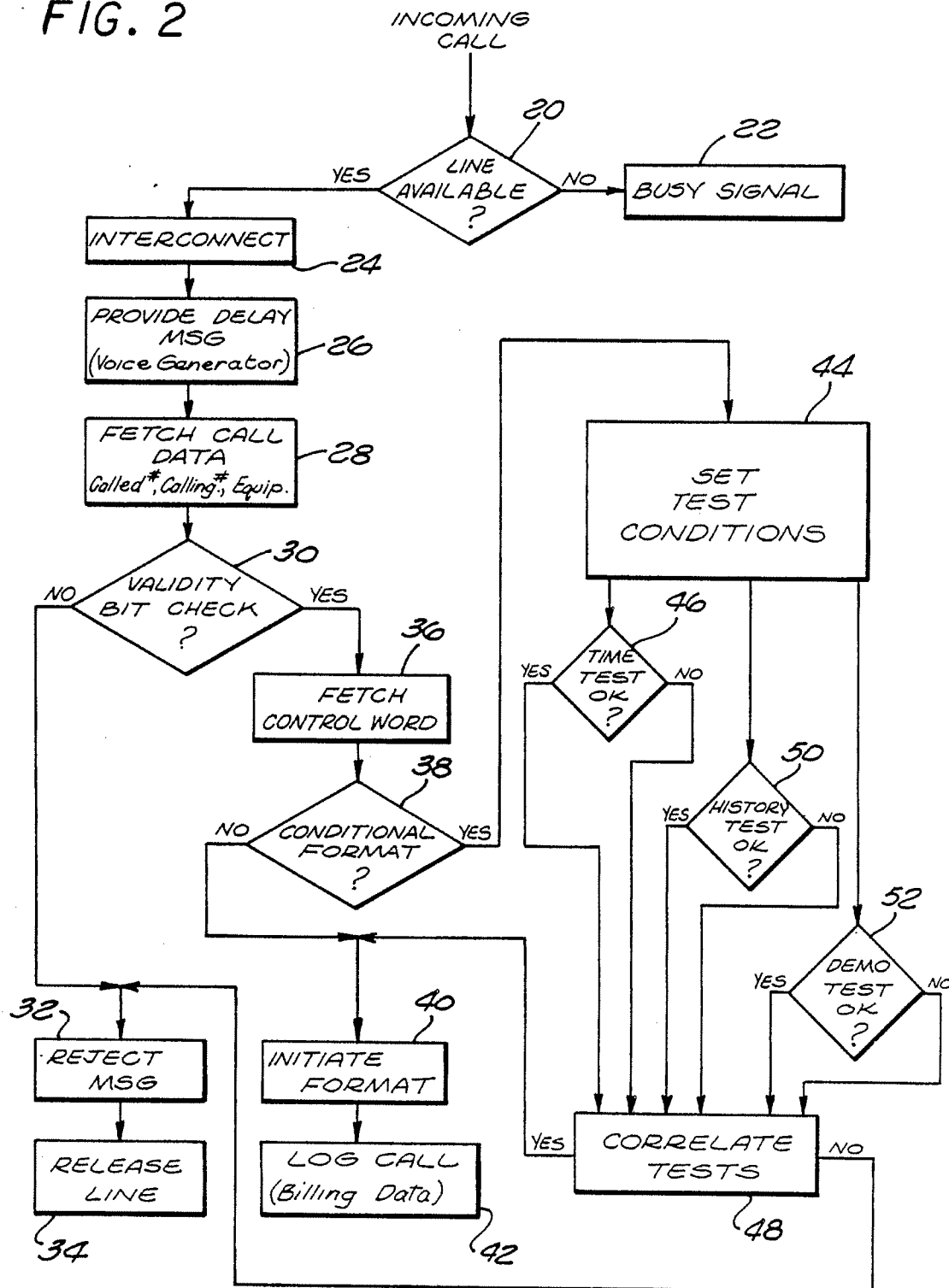
U.S. Patent

May 29, 1990

Sheet 2 of 5

4,930,150

FIG. 2



U.S. Patent

May 29, 1990

Sheet 3 of 5

4,930,150

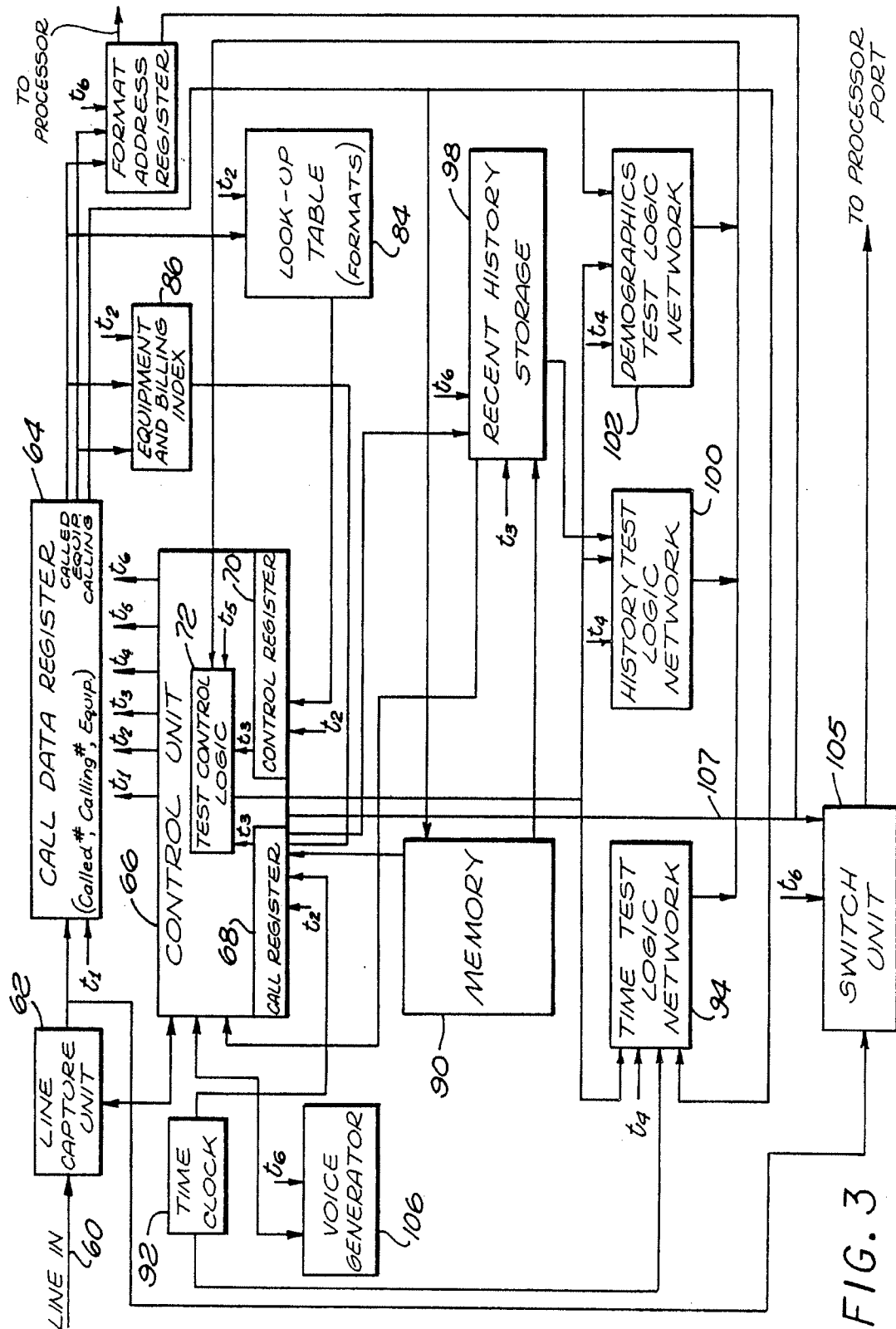


FIG. 3

U.S. Patent

May 29, 1990

Sheet 4 of 5

4,930,150

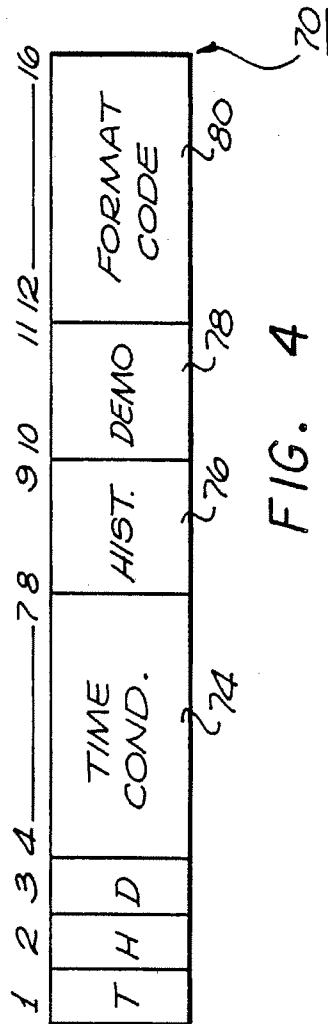
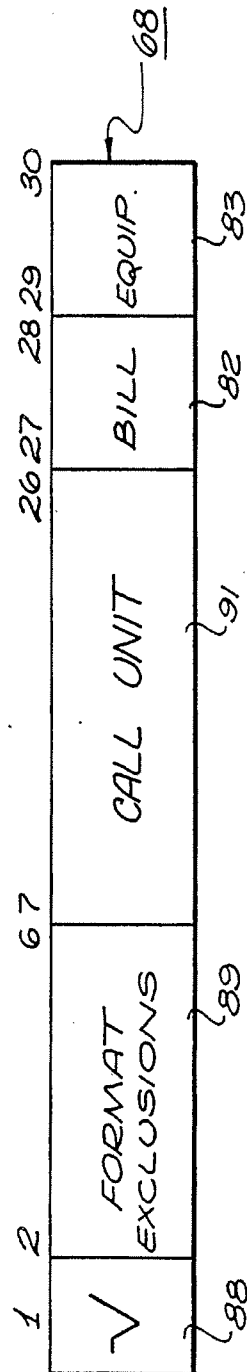


FIG. 5



U.S. Patent

May 29, 1990

Sheet 5 of 5

4,930,150

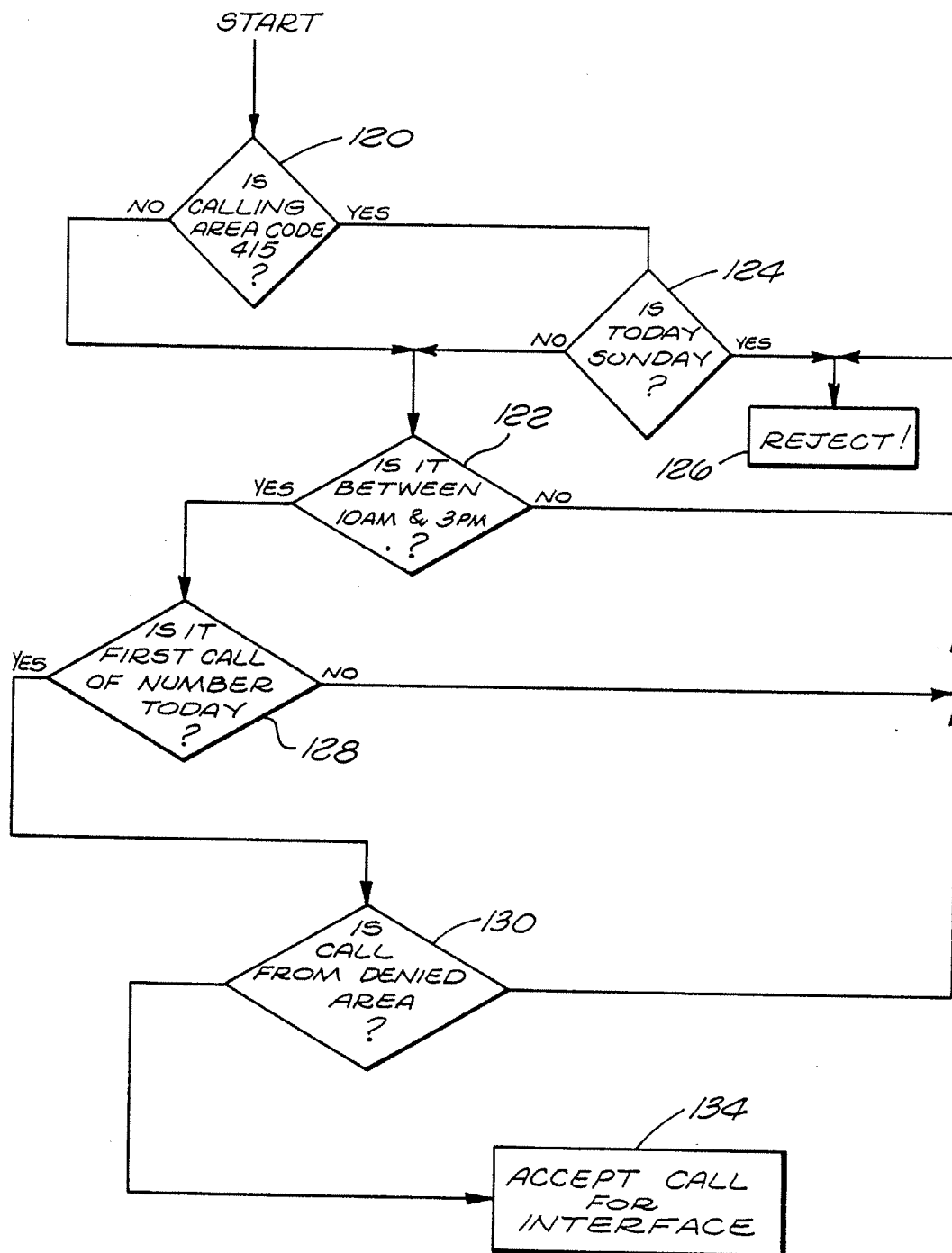


FIG. 6

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4,930,150

TELEPHONIC INTERFACE CONTROL SYSTEM**RELATED SUBJECT MATTER**

This is a continuation-in-part of Application Ser. No. 018,224 filed Feb. 24, 1987 and entitled "Statistical Analysis System For Use With Public Communication Facility", now U.S. Pat. No. 4,792,968, which was a continuation-in-part of Application Ser. No. 753,299 filed July 10, 1985 and entitled "Statistical Analysis System For Use With Public Communication Facility", now abandoned.

BACKGROUND AND SUMMARY OF THE INVENTION

Over the past several years, substantial expansion has occurred in the technology of combining telephonic and computer systems. For example, telephone systems have been developed to readily transmit digital data. Various forms of modems are in wide-spread use to intercouple telephones and computers. However, at a more personal level, it also has been proposed to utilize the traditional dialing buttons of telephone instruments to provide digital data, as for processing. In accordance with such arrangements, voice messages prompt callers to provide data by actuating the alphanumeric buttons of conventional telephones. These systems have been proposed in association with computers to provide various services and one such system is disclosed in U.S. Pat. No. 1,792,968, issued 12/20/88 to Ronald A. Katz from an application Ser. No. 07/018,244 filed Feb. 24, 1987.

With respect to telephonic-computer systems, attaining the interface format desired by an individual caller is sometimes complex and burdensome. Specifically, callers may be misdirected, screening may be ineffective and delays may be cumbersome. Also, records may be poor or non-existent. As a consequence, a need exists for an improved interface system for selectively interfacing a considerable number of individual callers with a multiple format processor, as to attain efficient and economical digital and vocal exchanges along with data accumulation.

In general, the present invention comprises a telephonic-computer interface system accommodating digital and vocal (analog) telephonic communication and capable of handling a large number of calls to interface a plurality of formats in a computer apparatus. Accordingly, the system of the present invention interfaces: (1) a telephonic communication facility including remote terminals for individual callers, e.g. conventional telephone instruments including voice communication means, and digital input means in the form of alphanumeric buttons for providing data and (2) a multiple-port, multiple-format data processor for concurrently processing data from a substantial number of callers with respect to any of several formats.

The interface system incorporates a controller for receiving calls from remote terminals for association with ports in the telephonic computer apparatus, and which receives signal-represented call data (representing "calling" and "called" telephone numbers) along with equipment information. An index apparatus is controlled by the signal-represented call data to select a specific format of the processor so as to specify any conditions for the interface, at least one of the formats including at least one condition. A test apparatus determines whether or not an individual call attains specified

2

conditions and thereby controls switching structure for providing the actual interface. Data is recorded and processing procedures also may be controlled by call data.

BRIEF DESCRIPTION OF THE DRAWINGS

In the drawings, which constitute a part of this specification, an exemplary embodiment exhibiting various objectives and features hereof is set forth, specifically:

FIG. 1 is a block diagram of a system constructed in accordance with the present invention;

FIG. 2 is a flow diagram illustrating the operating process of the system of FIG. 1;

FIG. 3 is a block diagram of a component portion of the system of FIG. 1;

FIG. 4 is a diagrammatic representation of a binary control word as registered and utilized in the system of FIG. 1;

FIG. 5 is a diagrammatic representation of a binary data record word as utilized and recorded in the system of FIG. 1; and

FIG. 6 is a flow diagram illustrating the operating process of the structure represented in FIG. 5.

DESCRIPTION OF THE ILLUSTRATIVE EMBODIMENT

As required, a detailed illustrative embodiment of the present invention is disclosed herein. However, physical communication systems, data formats, and operating structures in accordance with the present invention may be embodied in a wide variety of forms, some of which may be quite different from those of the disclosed embodiment. Consequently, the specific structural and functional details disclosed herein are merely representative; yet in that regard, they are deemed to afford the best embodiment for purposes of disclosure and to provide a basis for the claims herein which define the scope of the present invention.

Referring initially to FIG. 1, a series of remote terminals T1-Tn (telephone instruments) are represented (left). The terminals T1-Tn are generally similar and accordingly only the terminal T1 is shown in any detail. The indicated terminals T1-Tn represent the multitude of telephone terminals existing in association with a communication facility CO which may comprise a comprehensive public telephone network.

The communication facility CO, along with the individual terminals T1-Tn, is coupled to a central processing station CS generally indicated by a dashed-line block. Generally with regard to the station CS, individual terminals T1-Tn are interfaced with a processor P (upper right) through a call receiver unit CU and a switch SW. In accordance herewith, individual telephone calls are preliminarily processed on the basis of signal-represented call data to identify a specific operating format of the processor P. The preliminary processing may impose screening tests to impose conditions or establish a test criteria for the switch SW to determine the acceptability of the call to interface with a specific operating format.

Calls are selectively processed according to a specific operating format as indicated by call data. At any instant of time, the collective interface may involve several thousand calls simultaneously being processed through ports of the processor P. Exemplary selected formats of the processor might include: public polls, lotteries, auctions, promotions, sales operations and

3

4,930,150

4

games. Accordingly, the processor P may take the form of a sizable computer capable of simultaneously processing many calls involving several different formats. Although numerous possible configurations are available, for purposes of explanation, the processor P is illustrated simply as a block with multiple ports. Note that while the switch SW and the processor P may be integrated in a single system, they are separately illustrated to isolate the detailed structure and process of the present invention.

Input lines LI1 through LIn from the call receiver unit CU enter the switch SW to provide calling data and communication paths. Output lines LOI through LOm function similarly between the switch SW and the processor P. Note that various multiplexing techniques are well known in the telephonic art to communicate call data and may be employed in the system.

Considering the system somewhat summarily, individual calls originating at the terminals T1-Tn are coupled through the communication facility CO and the call receiver unit CU to the switch SW. Call data, representative of calls, actuates the switch SW to preliminarily process each call based on the desired format. Accordingly, depending on the desired format (indicated by the called number and the equipment data) calls are screened by testing for specific conditions. Furthermore, record data is assembled for storage.

Considering the system of FIG. 1 in somewhat greater detail, the exemplary telephone terminal T1 includes a handpiece 10 (microphone and earphone) and a panel 12 provided with a rectangular array of push buttons 14 in a conventional configuration. Of course, the handpiece 10 accommodates analog signals while the panel 12 is a digital apparatus. Generally, the handpiece 10 serves to manifest analog or voice signals to a caller.

In accordance with conventional telephone structure, alphabetic and numeric designations are provided on the buttons 14. For example, several of the buttons 14 carry three letters along with a decimal digit. Specifically, the button designated with the numeral "2" also carries the letters "A", "B" and "C". Thus, the buttons 14 encompass the numerals "0-9" two symbols, and the alphabet except for the letters "Q" and "Z". Consequently, the buttons 14 substantially accommodate the entry of decimal and alphabetic data.

At this stage, same specific aspects of the communication facility CO are noteworthy. Essentially, with telephonic dialing, the communication facility CO couples selective terminals (from the multitude of terminals T1-Tn) to the call receiver unit CU. In that regard, the call control unit CU at the central station CS may be reached by any or a plurality of called numbers. For example, the call unit CU might be reached by any of twenty telephone dialing numbers, each associated with a specific operating format of the processor P. One called number or set of numbers might be associated with an auction format of the processor P. Another number or set of numbers might be associated with sales operating formats. Still another called number or set of numbers might identify a game format, and so on.

Incoming calls to the call receiver unit CU are identified by call data in accordance with telephone system techniques. As described below, the call data may specifically include digital signals representative of the called number the calling number (terminal number) and the terminal equipment.

In addition to attaining a preliminary interface with a selected format, individual calls may be screened based on the called number (identifying an operating format) and the calling number (caller identification) or the equipment. That is, the system of the present invention is based on a realization that signal-represented call data can be effectively utilized to selectively interface individual callers at remote terminals with specific operating formats of a data processor.

Considering the call data in somewhat greater detail, in accordance with current telephone systems, the communication facility CO may provide signal-represented call data for: the "called" number, the "calling" number and the equipment, e.g. "pulse" or "tone" terminal. Specifically, operating telephone equipment termed "DNIS" automatically provides the called telephone number in digital form from the communication facility CO. Somewhat similarly, existing telephonic equipment designated "ANI" automatically indicates the caller's (calling) number in digital signal represented form. Generally, time shared lines carry such call data and also may provide call data indicating equipment. Thus, the call unit CU may receive the called number, the calling number and an equipment designation, collectively termed call data, which data is utilized to establish control functions, as for example to select an operating format of the processor P and screen individual calls.

As described in detail below, call data is registered in the switch SW to perform distinct control operations. Specifically, a selection section 16 of the switch SW identifies a specific desired format of the processor P. A testing section 18 of the switch SW screens calls for interface connections between individual terminals T1-Tn and the processor P.

In the illustrative system of FIG. 1, an operating process is executed as illustrated in FIG. 2. Each incoming call prompts a preliminary query as indicated by block 20 concerning the availability of a line or port into the processor P. In the absence of an available line, a busy signal is provided as indicated by the block 22. Alternatively, an available line results in a preliminary interconnect as indicated by a block 24 setting a conditional connection into operation.

As indicated by a block 26, during the screening or testing interval (typically measured in seconds or fractions of seconds) the caller remains on line and may receive a message. That is, the caller might hear silence or may continue to hear the traditional telephonic ringing sound. Alternatively, the caller might be given a brief vocal message to "stand by" as indicated by the block 26. In any event, the caller is held "on line" while the process continues.

With a call on a line, the communication facility CO (FIG. 1) provides signal-represented call data, e.g. the called number, the calling number and the equipment designation. As indicated by block 28 (FIG. 2) signals representative of the call data are captured to perform preliminary processing operations as will now be considered.

In the disclosed embodiment, as an initial test operation, the calling number is checked for validity as indicated by a block 30. For example, a list of calling numbers may be compiled that are to be denied access to any interface with the processor P. Negative calling numbers may result either by the choice of the person responsible for the calling number terminal, or by the choice of the service operating the processor P (FIG.

4,930,150

5

1). For example, an accumulation of prior improper transactions from a terminal designated by a specific telephone number may provide a basis for complete disqualification. Equipment also may disqualify.

Recognizing that various circumstances may be involved with respect to the total disqualification of a calling terminal, in accordance herewith the test involves formulation of a validity bit as indicated by the query block 30. Acceptable calls set the validity bit at a binary "1".

If the calling terminal is invalid, ("no" from the block 30) the call is rejected as indicated by the block 32 with or without a message and the line is released as indicated by the block 34. Note that the time interval involved is very short and the rejection message may take various forms including a verbal comment, a busy signal or simply a disconnected signal.

If a positive validity bit ("1") is formed at the junction of the query block 30, a control word is fetched under command of the called number as indicated by the block 36. As described in detail below, a control word is available or each operating format of the processor P and is utilized to impose the conditions for an interface and the terms of any associated billing.

As indicated in FIG. 2, the fetched control word of the block 36 prompts an inquiry as to the conditions attendant the selected operating format as indicated by a query block 38. That is, in the process, the query of block 38 determines whether further conditions are imposed for attaining interface with the processor P. If no further conditions are imposed, the format is initiated by pursuing the connected interface as indicated by a block 40. Also, as indicated by a block 42 the call is logged or recorded as with respect to billing data for example.

If access to a format involves conditions ("yes" from the query block 38), tests are specified as illustrated by a block 42. That is, conditions for the interface are specified by the block 44. Of course, the specific tests may involve various criteria; however, in the illustrative embodiment, the conditions involve time, history and demographics. Each exemplary condition will now be considered somewhat preliminarily.

In the disclosed embodiment, time tests involve testing the time or the call against certain limitations. For example, it may be desirable to limit some formats to specific time intervals as in relation to a television broadcast, a real time auction and so on. Note that the time tests also may be related to specific terminal control and geographic areas treated on the basis of telephone area codes. Specific examples will illustrate.

Assume an operating game format that propounds questions to a caller based on knowledge of a particular television program. The program may be broadcast at different times in different geographic areas, and as a consequence it may be desirable to limit calls interfacing the processor format depending on the area code of calling numbers. Accordingly, time tests may involve solely the instant time, or various combinations of time and call data. The specific test is determined as indicated by a block 46 (FIG. 2) imposing detailed operating instructions for the format. The test results are then correlated as represented by a block 48.

As indicated above, in accordance with the described embodiment, another test involves a historical record as for example directed to the station identified by the calling number. As an example, the record might take the form of either a negative or a positive file (for an

6

individual format). In that regard, formats involving "pay to dial" calls might be conditioned as a group. Generally, in the case of a negative file, certain numbers are recorded that are to be denied access to a particular operating format. In the case of a positive file, access to the operating format is available only to calling numbers listed in the file.

Considering exemplary implementations of the system, a negative file may be based on limited or restricted use (as in the case of a lottery) or prohibitive use (telephone terminal owner choice). Formats accessible on a "one-time only" basis also may be controlled by negative lists. Thus, an operating format may be inaccessible to a terminal, or may be accessible a specified number of times during a specified interval, e.g. three accesses per week. The historical test is symbolized in FIG. 2 by the query block 50 to conditionally actuate the related tests as indicated in the block 48. History limitations also may involve purely format limits. For example, a give-away or dial-free format may be limited to some predetermined number of calls for a period, e.g. ten thousand calls per day. Thus, limits can be imposed on the economic exposure of a format.

Moving from the historic considerations, demographic tests may be specified as in relation to the geographic area manifest by the area code of the calling number. To consider a specific example, a public opinion poll may be conducted in which a particular geographic balance is defined. In such an operating format, calls may be accepted only until particular quotas are attained with respect to specified area codes. Such tests in the process are indicated by the query block 52, again to instruct the correlation block 48.

With the requisite tests established by selection of a format, the block 48 indicates resolving the acceptability of the call for the selected interface face format. If the call is accepted, the process moves to initiate the selected format interface as indicated by the block 40. Conversely, if the call is to be rejected, the process moves to the step indicated by block 32, i.e. reject the call as with a message and release the line.

Exemplary detailed structure of the switch SW (FIG. 1) for executing the process of FIG. 2 is represented in FIG. 3. In that regard, individual telephone calls are manifest from the call receiver unit CU (FIG. 1) comprising existing equipment as well known in the prior art. The call data is supplied through a line 60, upper left, FIG. 3. Note that the represented single line 60 is merely symbolic of a channel to carry call data and provide direct telephone communication.

Generally, the system of FIG. 3 illustrates elements of the switch SW of FIG. 1 for processing an individual call. As indicated above, the system of the present invention involves the simultaneous processing of many calls with the possibility that numerous calls are simultaneously being tested for an interface as explained above. Consequently, although the system of FIG. 3 is illustrated with respect to testing a single call, it is to be understood that sequential or parallel operations and multiplexing techniques, as well known and widely practiced in the computer field, are utilized to accomplish multiple processing operations as described below with reference to FIG. 3.

The line 60 (FIG. 3, upper left) enters a line capture unit 62 through which signal-represented call data is supplied to a call data register 64. Accordingly, the call data is registered to be available for processing operations as explained generally with reference to FIG. 2.

7

The line capture unit 62 also is connected to cue a control unit 66. Structurally, the control unit 66 may take the form of various computer facilities incorporating memory and logic capability to sequence and control specific functions explained below. In that regard, the control unit 66 provides a series of timing signals t1-t6 to sequence the operations of individual component blocks as illustrated. Note that to preserve clarity in FIG. 1, connections of timing signals t1-t6 are not illustrated.

The control unit 66 specifically includes a call register 68, a control register 70 and test control logic 72. The control register 70 receives format control words specified by the called number and having a form as illustrated in FIG. 4.

Recapitulating, each of the operating formats has a control word for defining any access conditions or limitations to interface the format in the processor P (FIG. 1). Basically, the control words are sixteen bits, illustrated as the first sixteen bits (1-16) registered in FIG. 4. Additional registered bits (17-20) are provided from call data.

The initial three registered bits in the control register (FIG. 4) serve as test command bits respectively for a time test, a history test and a demographics test. The presence of a "1" bit in any of the first three bit locations specifies the requirement for testing compliance to specified conditions. A "0" bit indicates no test.

The bits "4 through 7" in the control register constitute a field 74 and specify time conditions in relation to the instant time of the call. The field 74 may specify eight distinct time conditions. For example, exemplary specified conditions for a format might be as follows:

- Accept calls between 7:00 and 18:00,
- Accept calls on Thursday between 9:00 and 10:00,
- Accept calls from area code 213 on Wednesday between 15:00 and 16:00,
- Accept calls from area code 602 on Wednesday between 16:00 and 17:00.

Essentially, the time condition field 74 (activated by the time bit "1"—first bit position) defines specific intervals during which calls will be accepted for the specific called number and may be further limited by the area codes. A wide range of possibilities are available to accommodate specific programs for individual formats.

A field 76 in the control register embraces bits "8" and "9" and defines the conditions for access to the format based on historical considerations. Thus, two bits are provided to indicate four possible historical limitations. Again, the test is specified by a "1" bit, in this instance in the second bit location of the register 70. The following limitations are exemplary of many possibilities:

- Accept one call per day,
- Accept one call per week,
- Accept one call per month,
- Accept one call during any three-day period,
- Accept only 10,000 calls.

Continuing with respect to the contents of the register 70, as illustrated in FIG. 4, bits "10" and "11" constitute a field 78 specifying demographic test limitations. Again, a few examples will illustrate the various possibilities:

- Accept calls only from area code 213,
- Accept calls from area codes 213, 818 and 619,
- Accept only 1,000 calls from area code 213,
- Accept calls from area code 213 with the prefix numerals 619.

4,930,150

8

Again, the demographic text is imposed only upon the existence of a "1" bit, in this instance in the third bit of the control word. As in the other cases, specific possibilities are considerable.

The bits "12" through "16" of the control word constitute a field 80 and designate a code for the identified format. These five bits enable a substantial number of formats to be designated and coded with respect to various classifications. For example, lottery formats might be encoded in a "100" decimal series, e.g. "101, 102, 103 — 110, 111, 112"—and so on; auctions might be designated in a "200" series, e.g.: "201, 202, —". By using decimal equivalent coding formats for various categories, exclusions may be concisely stated. For example, a calling number may be excluded from all lottery operating formats simply by the specification of decimal "100".

The data, as illustrated in FIG. 4 is loaded into the control register 70. Again, the first sixteen bits comprise the format control word and are provided from a look-up table 84 (FIG. 3, right, central). The last bits (bits 17-20) are provided from an equipment and billing instruction index 86. That is, in response to the signal-represented call data indicating the called number and the equipment, the look-up table 84 and the index 86 supply data for loading the control register as indicated above.

While the control register 70 is loaded to specify the operation of the system, the call register 68 in the control unit 66 receives signals for additional control and to formulate a record of the call. Specifically, as represented in FIG. 5, the contents of the call register 68 includes the initial validity bit 88 for indicating that the called number is either on a positive list or is not on a negative list. The determination of the validity bit for location 88 is made by reference to a memory 90 (FIG. 3, central) addressed by the calling number.

While the calling number addresses data to indicate a validity bit, specific format exclusions also may be indicated as explained above with respect to certain formats. For example, certain classifications of formats or specific formats (as a lottery) may be identified as inaccessible for certain telephone terminals as identified by calling numbers. Other than lottery formats, certain discretionary formats also may initiate control to limit access. Accordingly, a field 89 in the register 68 of FIG. 5 (bits "2" through "6") is provided from the memory 90, addressed by the calling number to specify format exclusions. That is, the calling number addresses the memory 90 to load the field 89 and specify limitations. Consider a few examples of format exclusions or limitations:

- No lottery formats,
- One lottery format per week,
- Two lottery formats per month of total cost under \$25.00,
- No auction sales,
- Auction sales only with code I.D. 763.

Again, it will be apparent that many possibilities exist in applying various coding techniques, the above merely being exemplary.

The bits "7" through "26" of the call register 68 (FIG. 5) constitute a field 91 and indicate the time of a call. Signals representative of the instant time of a call to load the field 90 are provided from a time clock 92 (FIG. 3, upper left). Signals from the time clock 92 may be in a Julian code and are provided to the call register 68 and also to a time test logic network 94 (lower left).

9

4,930,150

The last bits (27-30) in the register 68 are provided from the call data. The bits "27" and "28" indicate billing data and comprise a field 82. Again, representations are coded; however, with respect to the field 82 information is derived from the called number. For example, an "800" called number may indicate no billing with the representative code being stored in the field 82. As another possibility, a "976" prefix number, or "900" number, may indicate a specific charge in relation to the identified format.

The bits "29" and "30" comprise a field 83 and may actuate a special form of the selected format. In the disclosed embodiment, the field 83 registers call data, as to indicate that the calling terminal is a "pulse" (rotary dial) signal unit or a "time" (touch) signal unit. In the instance of a rotary terminal, the format program may be modified to accommodate "pulse" signal operation or inject operator communication.

Recapitulating to some extent with regard to the composition of the call record word in the register 68 (FIG. 5), the memory 0 (FIG. 3) is addressed by calling number data to provide data for the validity bit location 88 and the format-exclusion field 89. The time of call is stored in the field 91 from the clock 92. The billing and equipment data are provided by the index 86 in response to "calling" data signals.

Another element of memory, specifically, a recent history storage 98 (FIG. 3, lower right) is separately illustrated for convenience of explanation. Essentially, the storage 9 receives words from the call register 63 to maintain a record of interface calls. The recent history storage may periodically be purged to permanent storage if desired. Thus, the recent history storage 98 accumulates a historical record of all interface participants with respect to specific formats and is utilized in the history test for determining that an instant calling terminal is within the specified historical limitations as provided from the memory 90.

The history tests are performed by a history test logic network 100 (FIG. 3, lower central). In a related context, the demographics test as explained in detail above is performed by a demographics test logic network 102. The results of the test logic networks are communicated to the test logic 72 in the control unit 66. As a consequence a switch unit 105 is actuated to either operatively couple the line 60 into a port of the processor P (FIG. 1) or reject the call. If a call is accepted for an interface, a signal is supplied from the test control logic 72 through a line 107 to the switch 105 during the interval of the timing signal T6. The signal in the line 107 also is supplied to a format address register 109 for addressing the processor P. The register 109 stores select data signals to address a specific operating format of the processor P.

Recapitulating to some extent, call data indicates an interface format of the processor P (FIG. 1) with associated limitations, conditions and billing provisions. Call data also indicates possible format limitations or conditions for a calling number. The system processes the data with respect to the conditions and limitations to selectively enable interface operations.

In view of the above structural description of the system of FIG. 3, the process as described with respect to FIG. 2 and the stored control word forms as described with respect to FIGS. 4 and 5, a comprehensive understanding of the described embodiment may now best be accomplished by assuming an exemplary call and treating the individual responsive steps. Accord-

10

ingly, assume the occurrence of a call as manifest on the line 60 (FIG. 3, upper left). Further, assume that the called number, "976 513 7777" designates a lottery format with limited access. Details of the limited access will be treated below.

Upon occurrence of the call, the line capture unit 62 seizes a line relationship and signals the control unit 66. Immediately, an interval of time signal t1 is initiated and the register 64 is loaded with the called number ("976 513 7777"), the calling number ("415 318 4444") and the equipment designation (tone). To the caller, the operations as now described involve an almost imperceptible delay.

During the following interval of timing signal t2, the call register 68 and the control register 70 are loaded as illustrated in FIGS. 4 and 5. Specifically, the called number and equipment designation specify data to load the control register 70. The calling number ("415 318 4444") from the register 64, prompts the memory 90 to load the validity bit 88 and the format exclusions in the field 89 of the register 68. Concurrently, the time clock 92 loads the field 90 with signals representative of the current time.

If the call register 68 does not receive a validity "1" bit, the calling number is indicated to be barred with a consequence that the line is released by the control unit 66. In that regard, a voice generator 106 (FIG. 3, left central) may be actuated by the control unit 66 branching to the operation of timing signal t6. Accordingly, a message of denial may be provided on the line 60 prior to release of the line. Note that the voice generator 106 may be variously used to prompt or inform callers in certain preliminary selection operations supplemental to the specific operations disclosed below.

As indicated above, concurrently with the loading of the call register 68 (timing signal t2), the control register 70 also is loaded. Specifically, from the register 64, the called number cues the look-up table 84 to fill most of the control register (bits "1" through "16", FIG. 4). The fields 82 and 83 are supplied from the index 86.

That is, distinct from the fields loaded into the control register 70 from the look-up table 84, the fields 82 and 83 are supplied from the index 86. In that regard, assume the called number (area code 976) indicates that the charge for the service of the call will be billed through the caller's telephone records. Assume that the field 83 indicates a "tone" terminal effective for a conventional digital interface.

At this point, some still further assumptions will be made to pursue the explanation of the detailed operations. Specifically, assume that the format specified by the called number ("976 513 7777") is a lottery format and includes limitations with respect to time, history and demographics. Accordingly, the initial three bits of the control word all will be "1" bits in the control register 70.

Assume further that the time conditions specified by the field 74 (FIG. 4) limit calls from area code 415 to days other than Sunday. Assume that the history field 76 of the control word imposes a limitation of one call per day. Assume that the demographics field 78 excludes any call from area codes "512", "412", "812", — (not "415"). Finally, assume the selected format (field 80) designates a specific lottery format, that is lottery "128".

In addition to registration of the data sets detailed above, because a history test is specified, the recent history storage 98 is cued during the interval of timing

4,930,150

11

signal t3. The operation is through the memory 90 by the control unit 66 to prompt the supply of historical data (previously registered record words) for the telephone terminal designated by the calling number ("415 318 4444"). Specifically, during the interval of timing signal t3, the storage 98 supplies data on the calling number to the history test logic network 100. Such data is compiled into a test format as to indicate the number of calls per day, per week, and so on. Note that aggregate call totals may also be supplied as a test criteria. Thus, the control unit 66 coordinates the test criteria data preparatory to the test operations of the individual logic networks 94, 100 and 102.

To summarize, in accordance with the above assumptions, the test control logic 72 is set up to coordinate the following specific logic tests:

Time limitation test by network 94: accept calls from area code 415 except on Sunday,

History limit test by network 100: accept only one call per day,

Demographics test by network 102: accept no calls from area codes 512, 412, 812 — (415 not listed).

As explained above, in addition to the limitations specified, in relation to the format, further limitations may be specified by the calling number. Such limitations are specified by the field 89 in the register 68 (FIGS. 3 and 5). In the instant example, assume that according to the record word, participation in the lottery format is limited to the interval between 10:00 a.m. and 3:00 p.m., e.g. when minors are in school. The code for such a format is supplied during the interval of timing signal t3 from the field 89 of the call register 68 to further establish the set-up of the logic 94 acting through the test control logic 72.

Recapitulating with regard to the test control logic 72, essentially a program is defined imposing each of the limitations that are specified by the call data in sufficient detail that comparison tests are expediently performed by the networks 94, 100 and 102. It is stressed, as indicated above, that the tests are selectively performed only in the event a "1" bit appears in the representative first three bit locations of the control word format. In the illustrative example, all the tests were commanded and accordingly the test control logic 72 sets up the condition for tests to be performed by the networks 94, 100 and 102, all during the interval of timing signal t3. Of course, the specific example represents one possibility of a substantial number of programs that might be specified to the system.

With the test formats established in the test control logic 72, the logic networks 94, 100 and 102 are driven during the interval of test signal t4 to execute a program in accordance with the assumed example. The process may be variously implemented in logic using well known techniques and is detailed in FIG. 6. Consider the time test of the network 94. The time test logic network 94 approves an interface only if: the call is not from area code "415" on a Sunday and furthermore the call occurs between the hours of 10:00 a.m. and 3:00 p.m. As indicated in FIG. 6, a decision block 120 resolves the area-code "415" time test. If the area code is not "415", the logic proceeds to the next query block 122. Alternatively, if the area code is "415", the day must be tested against Sunday as indicated by the query block 124. An affirmative indication from the Sunday test of block 124 prompts a rejection as indicated by the block 126.

12

If the Sunday test of block 124 is passed, the program imposes another time test, that is the time-of-day test as indicated by the block 122. Again, a negative result prompts a rejection; however, a positive result involves the next step as indicated by the block 128.

Note that the operations designated by query blocks 120, 122 and 124 are performed by the time test logic network 94 (FIG. 3). The next test of the block 128 is performed by the history test logic 100.

The block 128 (FIG. 6) involves a determination of whether or not the instant call is the first for the calling terminal on the instant calendar day. If not, the limitations are exceeded and the call is rejected. If the test is passed, the process next involves the demographic test logic network 102 (FIG. 3) to determine whether or not the call originated from an excluded area based on the calling number area code.

Area controls are illustrated by the query block 130 of FIG. 6. Specifically, the demographics test logic network 102 determines whether or not the current call is from a denied area. If so, the call is rejected as indicated by the block 126. Alternatively, if the area is not excluded, as illustrated by the block 134 in FIG. 6, the interface is accepted. In the instant case, the area "415" is acceptable.

In the operation of the system as illustrated in FIG. 3, the logic networks 94, 100 and 102 indicate test results to the test control logic 72 during the interval of the timing signal t5. The logic 72 correlates the test result for action by the control unit 66. If the imposed conditions are met, the control unit 66 actuates the switch unit 105 and the address register 109 through the line 107 to perfect the interface from the line 60 (upper left) to a port in the processor P (FIG. 1). Essentially, during the interval of the timing signal t6, the switch unit 105 couples the line 60 to a part in the processor P. Concurrently, the address register 109 specifies the select operating format to the processor P. Thus, a caller is set up for a select interface format.

Also during the interval of the timing signal t6, the contents of the call register 68 is stored in the recent history storage 98. Note that billing data is stored with the call word is and may be selectively extracted from the storage 98. At the termination of the timing signal t6, the interface endures until "disconnect".

The select format may involve various records, however, in accordance with the system of the present invention affords considerable flexibility to program individual conditions and limitations for each interface format based on the call data (calling number and called number). An interface may involve no conditions or conditions may be imposed from the called number (format selection), the calling number, or both. Accordingly, effective control may be imposed depending upon the service requested as manifest by an individual format, the instant time, the history of use and the demographics involved. The imposed limitations may be non-existent or may involve a relatively complex test pattern as explained in detail above.

In the disclosed embodiment, an effective record of calls is accumulated in the recent history storage 98. Thus, a composite and detailed record is accumulated of individual calls as executed.

It is to be appreciated that numerous formats may be implemented and controlled utilizing the principles of the system as illustrated above. Accordingly, it is to be understood that the system of the present invention

4,930,150

13

should be interpreted in accordance with the claims as set forth below.

What is claimed is:

1. An interface control system for use with, (1) a communication facility including remote terminals for individual callers, wherein said remote terminals may comprise a conventional telephone instrument including voice communication means and digital input means for providing data, and (2) a multiple port, multiple format processor for concurrently processing data from a substantial number of callers in any of a plurality of format, said interface control system comprising:
 - call data means for receiving calls from said remote terminals in association with ports of said multiple port, multiple format processor, said calls providing signal-represented call data to said call data means;
 - selection means for selecting one format of said plurality of formats of said multiple port, multiple format processor, said selection means being controlled by said signal-represented call data from a calling remote terminal to thereby specify defined conditions for a connection to said multiple port, multiple format processor, at least one of said formats having at least one specified condition;
 - test means for testing the specified defined conditions for a calling remote terminal to provide approval signals; and
 - interconnect switch means for providing connections from the ports of said multiple port, multiple format processor to a calling remote terminal under control of said approval signal from said test means.
2. A system according to claim 1 wherein one of said test means comprises means for executing a test based on the time of a call.
3. A system according to claim 1 wherein one of said test means comprises means for executing a test based on the history of the calling remote terminal.
4. A system according to claim 1 wherein one of said test means comprises means for executing a test based on the demographics of the calling remote terminal.
5. A system according to claim 1 wherein said index means includes a look-up table for specifying said formats of said processor addressed by said call data.
6. A system according to claim 1 including a control storage location and means for setting control data in said control storage location responsive to said call data to thereby control said test means.
7. A system according to claim 1 further including voice generator means for prompting a caller.

14

8. A system according to claim 1 further including means for storing data representative of calls.

9. A system according to claim 8 wherein said means for storing includes means for storing billing data.

10. A process for interfacing a telephonic communication system including remote terminals with a multiple port, multiple format data processing system, said multiple port, multiple format data processing system for concurrently processing data from said remote terminals according to a plurality of formats, at least one of said formats having at least one condition for a calling terminal, and wherein said telephonic communication system provides call data signals, as to indicate called and calling numbers, said process including the steps of: receiving said call data signals from said telephonic communication system for a calling remote terminal;

selecting a processing format of said multiple port, multiple format processing system for the calling remote terminal under control of said data signals as the selected format;

testing the selected format in relation to said call data signals; and

conditionally interfacing said selected format to a calling terminal under control of said testing of call data signals.

11. A process according to claim 10 further including the step of fetching control data addressable with said call data for use in the step of testing.

12. A process according to claim 11 including the step of composing a control word defining conditions for interfacing

13. A process according to claim 11 wherein said step of fetching control data includes fetching data to specify time constraint conditions.

14. A process according to claim 1 wherein said step of fetching control data includes fetching data to specify use history conditions.

15. A process according to claim 11 wherein said step of fetching control data includes fetching data to specify demographic conditions.

16. A process according to claim 10 further includes the step of formulating a record data word of a call.

17. A process according to claim 16 wherein said record data word includes billing data.

18. A process according to claim 16 wherein said record data word includes format data.

19. A system according to claim 1 wherein one of said test means comprises means for executing a test based on historical limitations applied to an individual format.

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EXHIBIT 3



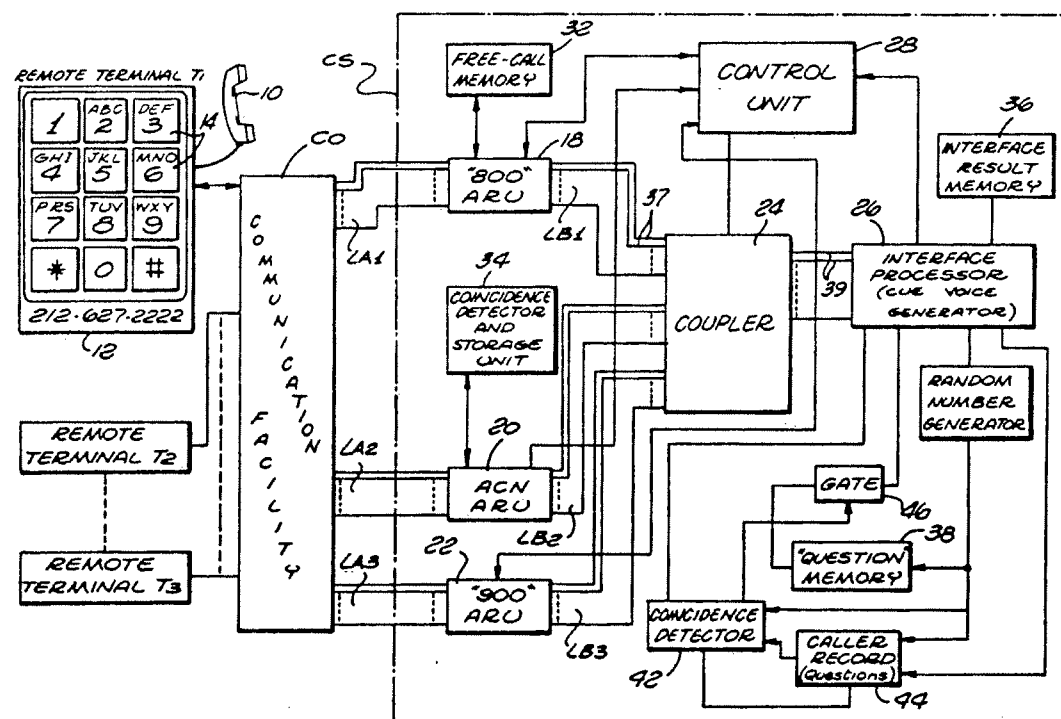
US005128984A

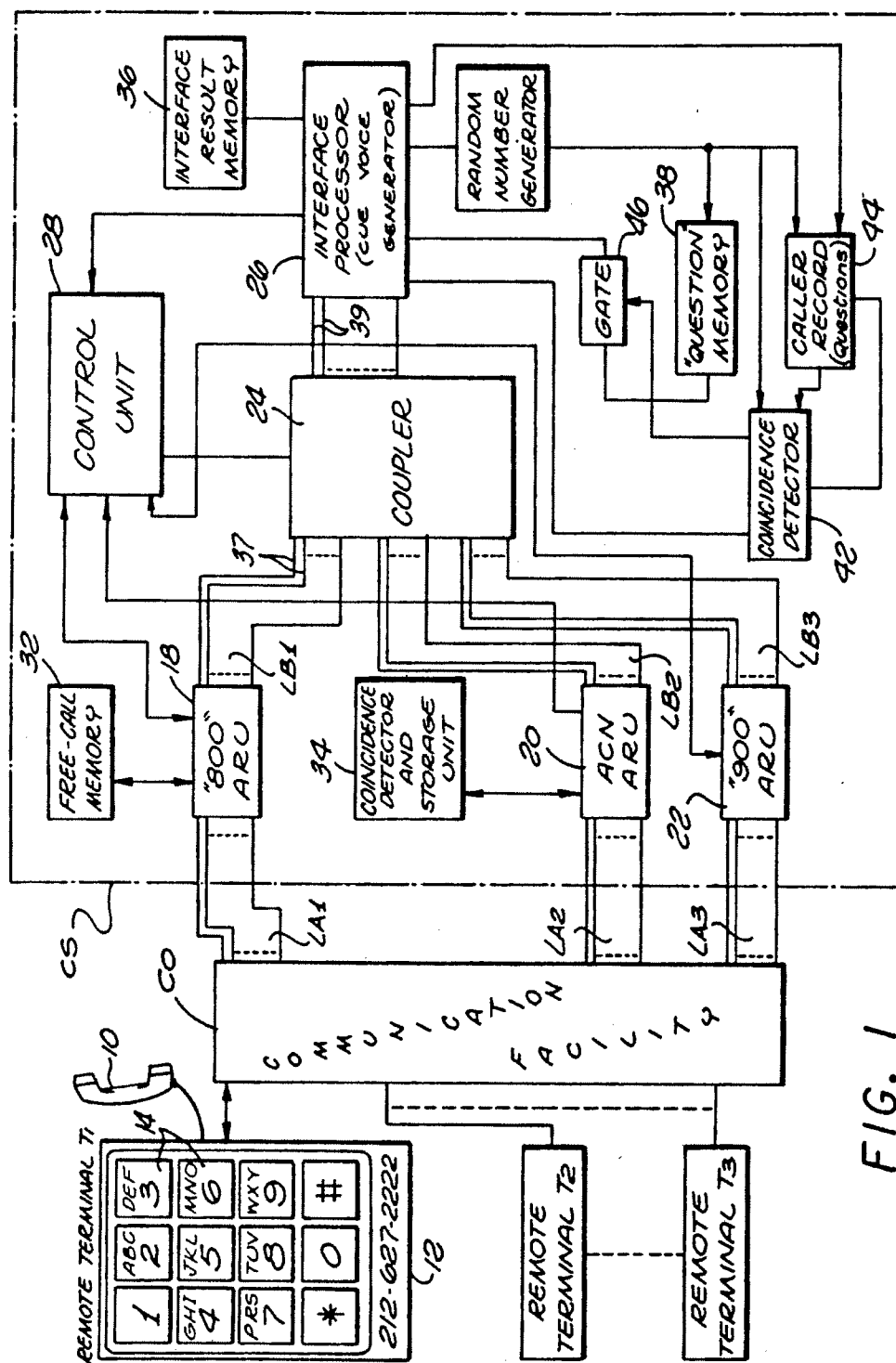
United States Patent [19]**Katz**[11] **Patent Number:** **5,128,984**[45] **Date of Patent:** **Jul. 7, 1992**[54] **TELEPHONE INTERFACE CALL
PROCESSING SYSTEM WITH CALL
SELECTIVITY**[75] **Inventor:** **Ronald A. Katz, Los Angeles, Calif.**[73] **Assignee:** **First Data Resources Inc., Omaha,
Nebr.**[21] **Appl. No.:** **425,779**[22] **Filed:** **Oct. 23, 1989****Related U.S. Application Data**[63] Continuation-in-part of Ser. No. 312,792, Feb. 21, 1989,
Pat. No. 5,073,929, which is a continuation-in-part of
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which is a continuation-in-part of Ser. No. 18,244, Feb.
24, 1987, Pat. No. 4,792,968, which is a continuation-in-
part of Ser. No. 753,299, Jul. 10, 1985, abandoned.[51] **Int. Cl.:** **H04M 11/00**[52] **U.S. Cl.:** **379/92; 379/97;
379/142; 379/95**[58] **Field of Search** **379/92, 97, 207, 225,
379/127, 201, 211, 266, 265, 142, 95**[56] **References Cited****U.S. PATENT DOCUMENTS**

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OTHER PUBLICATIONSInt'l Pub. No. WO87/00375, Katz, "Statistical Analysis
System for Use with Public Comm. Facility" Jan. 1987.*Primary Examiner*—James L. Dwyer*Assistant Examiner*—Stella L. Woo[57] **ABSTRACT**

For use with a public telephone network CO incorporating a vast number of terminals T1-Tn, a system CS limits and controls interface access to implement voice-digital communication for statistical processing. The system CS accommodates calls in different modes, e.g. "800", "900" or area code and incorporates qualifying apparatus to restrict against caller misuse. Alternative calling modes are used to reach an interface facility that also affords some control based on calling terminal identification, e.g. as by ANI equipment.

23 Claims, 2 Drawing Sheets



U.S. Patent

July 7, 1992

Sheet 2 of 2

5,128,984

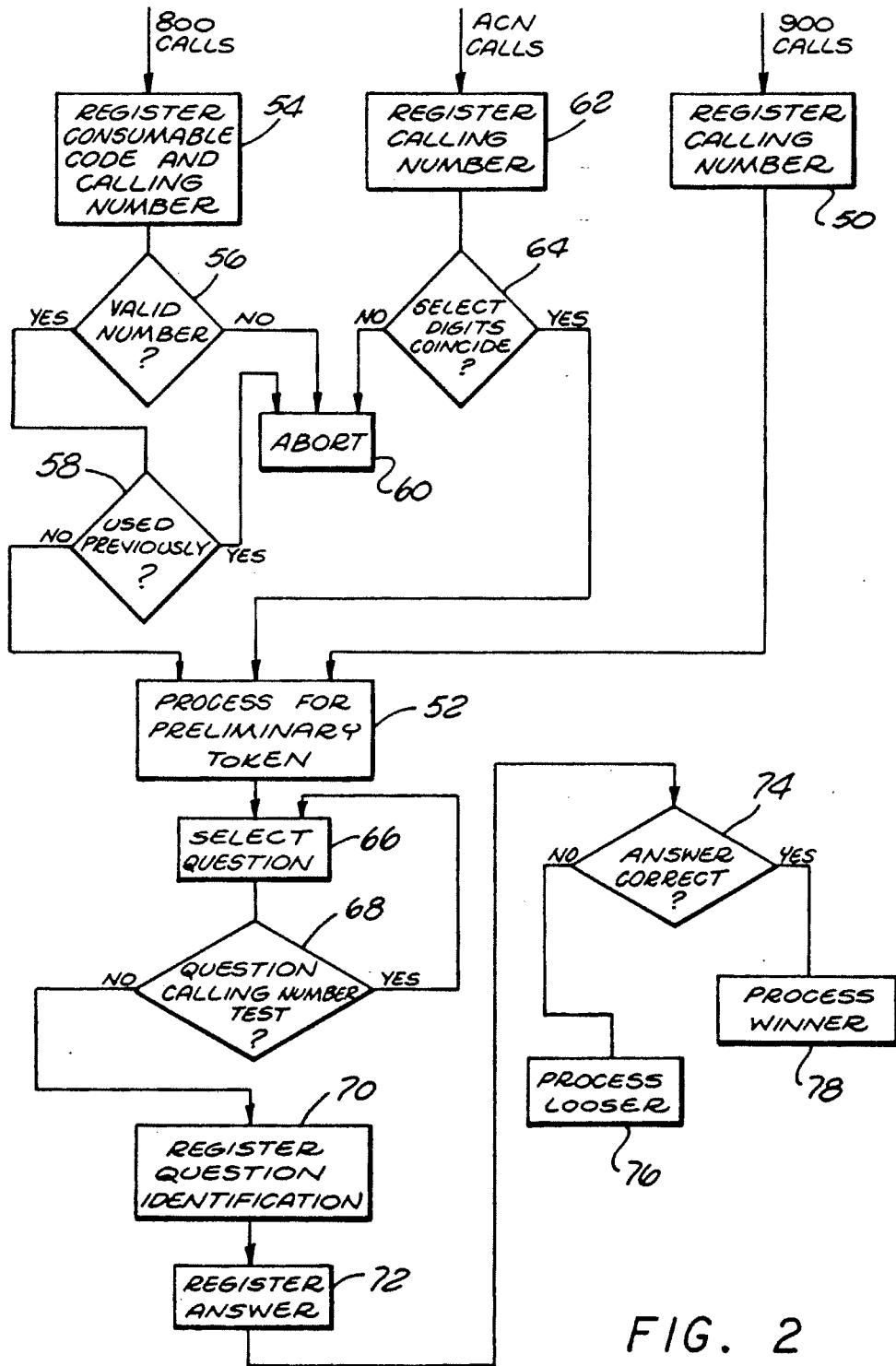


FIG. 2

1

5,128,984

2

TELEPHONE INTERFACE CALL PROCESSING SYSTEM WITH CALL SELECTIVITY

RELATED SUBJECT MATTER

This is a continuation-in-part of application Ser. No. 312,792 filed Feb. 21, 1989, and entitled "Voice-Data Telephonic Control System," now U.S. Pat. No. 5,073,929, which was a continuation-in-part of application Ser. No. 194,258 filed May 16, 1988, and entitled "Telephonic-Interface Statistical Analysis System", now U.S. Pat. No. 4,845,739, which was a continuation-in-part of application Ser. No. 018,244 filed Feb. 24, 1987, and entitled "Statistical Analysis System for Use with Public Communication Facility", now U.S. Pat. No. 4,792,968, which was a continuation-in-part of application Ser. No. 753,299 filed Jul. 10, 1985, and entitled "Statistical Analysis System For Use With Public Communication Facility", now abandoned.

BACKGROUND AND SUMMARY OF THE INVENTION

Recent years have seen a considerable growth in the use of telephonic communications. For example, in various applications, telecommunications applications have expanded to accommodate voice-digital interfaces between computer apparatus and callers at remote telephone terminals. For example, by actuating the push buttons at a remote telephone terminal, a caller controls a computer apparatus to provide various entertainment or information. In using such a system, a caller might telephone a financial service and selectively actuate the telephone key panel to receive information on specific stocks or bonds.

Digital interface systems also have been implemented to utilize digital signals provided independently of the caller's actions. For example, the so-called "ANI" telephone equipment provides digital signals indicating a caller's telephone number. Equipment designated "DNIS" is similarly available to indicate the called number. Thus, digital signals may be provided telephonically to a system associated with individual calling terminals as for identification or other use.

Telephonic games and contests are among the various applications that have been recognized for implementation with telephone interface systems. Such games and contests may be variously presented, as in cooperation with an advertising program for a product or in a lottery format. Generally with respect to such applications, various call modes might be utilized.

Essentially, three telephonic calling modes or services are in widespread use. Specifically, caller-charge or "900" service (including "976" calls) involves a charge to the caller for each call. The "900" calling mode is useful for implementing games and contests with telephone interface systems; however, certain problems are encountered. Specifically, certain telephone terminals, e.g. pay phones, do not accommodate "900" service. Also, with respect to certain forms of games and contests, it is important to offer members of the public an alternative "free" method of participation. In general, the system of the present invention may be employed to implement "900" calling modes while accommodating "free" participation with reasonable control.

Telephone calls may be accommodated without charge using "800" service or calling mode. Generally, the "800" calling mode accommodates free calls by

callers in various areas to a particular station incurring the charges. In most applications, it is important to regulate the use of the "800" calling mode. Another calling mode is the traditional method of calling, involving area-code numbers which also includes calls placed within a given area code which do not usually involve a specific charge and usually do not require dialing the area code. One of the problems associated with using the area-code calling mode for interface systems is the vast number of calls. For example, even in association with an advertising campaign, inviting members of the general public to participate in a free contest or game by telephone may prompt an overwhelming response. Accordingly, a need exists for a practical system to control and limit calls to an interface service in the traditional free area-code number mode.

Another aspect of telephonic-interface contests involves zealous or obsessive participants. For example, in a quiz contest, a zealous person might call repeatedly, researching answers to given questions until ultimately a question is repeated. At that time, the caller is ready with an answer and has an unfair advantage in the contest. Thus, a need exists for control within the interface system.

In general, the system of the present invention involves a telephone call processing system for receiving calls from a multitude of terminals in different call modes and for processing calls, as to a game or contest format, with means to limit repeat-call advantages. In a disclosed form, the system implements three calling modes to facilitate various formats while accomplishing certain protection both with regard to the calling mode and contest formats.

BRIEF DESCRIPTION OF THE DRAWINGS

In the drawings, which constitute a part of this specification, exemplary embodiments exhibiting various objectives and features hereof are set forth, specifically:

FIG. 1 is a block diagram of a system constructed in accordance with the present invention; and

FIG. 2 is a flow diagram of an operating format of the system of FIG. 1.

DESCRIPTION OF THE ILLUSTRATIVE EMBODIMENT

As required, a detailed illustrative embodiment of the present invention is disclosed herein. However, telephone techniques, physical communication systems, data formats and operating structures in accordance with the present invention may be embodied in a wide variety of forms and modes, some of which may be quite different from those of the disclosed embodiment. Consequently, the specific structural and functional details disclosed herein are merely representative, yet in that regard, they are deemed to afford the best embodiment for purposes of disclosure and to provide a basis for the claims herein which define the scope of the present invention.

Referring initially to FIG. 1, a series of remote terminals T1-TN (telephone instruments) are represented (left). The terminals T1-TN may be functionally similar and accordingly only the terminal T1 is shown in any detail. The indicated terminals T1-TN represent the multitude of telephone terminals existing in association with a communication facility CO which may comprise a comprehensive public telephone network.

3

5,128,984

The communication facility CO, accommodating the individual terminals T1-TN, is coupled to a central processing station CS generally indicated within a dashed-line block. In the station CS, to illustrate operating aspects of the present invention, calls are selectively accepted and interfaced so as to accomplish a desired operating format, for example a contest or game.

Generally, calls from the individual terminals T1-TN might be in any of three modes, i.e. the "800" mode, the "900" mode or the area-code mode (traditional area code plus number or local number dialing). In the disclosed illustrative system, depending on individual calling modes, calls are selectively accepted for interface processing. Generally, the interface format accommodates "900" calls with supplemental "800" calls to accommodate both "free" access and all types of telephone terminals. In the disclosed embodiment, calls in the "800" mode are restricted in accordance with prearranged limitations. Furthermore, calls in the area-code mode (from all areas), the 800 mode and 900 mode may be limited to callers having a station number containing a predetermined digit sequence. For example, calls might be restricted to those from terminals having a telephone number ending in the digits "234".

The processing station CS also is controlled to limit the effectiveness of zealous callers. For example, in a contest format, callers may be quizzed with questions randomly drawn from an inventory. In accordance herewith, questions are not repeated to individual telephone terminals T1-TN. Thus, some control is imposed on an aggressive caller who might otherwise be given two opportunities to answer the same question.

Considering the system of FIG. 1 in greater detail, the exemplary telephone terminal T1 includes a handpiece 10 (microphone and earphone) and a panel 12 provided with a rectangular array of individual push buttons 14 in a conventional configuration. Of course, the handpiece 10 accommodates analog signals while the panel 12 is a digital apparatus. During an interface operation, as disclosed in detail below, the caller is queued or prompted vocally through the handpiece 10 (earphone) to provide digital responses using the buttons 14.

At this stage, some specific aspects of the communication interface are noteworthy. Essentially, as a result of telephonic dialing at one of the terminals T1-TN, the communication facility CO couples the select terminal to an audio response unit. Specifically, to illustrate various aspects, three separate audio response units are provided in the station CS to accept calls in the three distinct modes. That is, an audio response unit 18 receives calls in the "800" mode. An audio response unit 20 receives calls in the area-code dialing mode, and an audio response unit 22 receives calls in the "900" dialing mode.

It will be understood that although three separate audio response units are illustrated, systems incorporating the principles of the present invention may well incorporate various numbers of audio response units for each calling mode, with each audio response unit having the capability to accommodate a substantial number of calls as indicated by the lines from the communication facility CO in FIG. 1. Alternatively, a single composite unit might be utilized. Also, the mode or aspects of the described embodiment might well be implemented singly or in various combinations. Herein, for purposes of explanation, calls are treated individually

4

and processed accordingly through the three audio response units 18, 20 and 22.

Generally, the audio response units 18, 20 and 22 connect callers at remote terminals T1-TN from the communication facility CO through a coupler 24 (FIG. 1, station CS, center) to an interface processor 26. Both the coupler 24 and the processor 26 are connected to a control unit 28 that is also connected to the audio response units 18, 20 and 22. Accordingly, with overall supervision by the control unit 28, the audio response units 18, 20 and 22 answer and preliminarily qualify callers from the terminals T1-TN for connection through the coupler 24 to the interface processor 26.

Upon completion of an interface connection in the disclosed embodiment, a contest format is executed by vocally prompting callers to respond with digital data. At this point, it is noteworthy that the communication facility CO also provides identification signals to the audio response units 18, 20 and 22. Specifically, digital identification signals representing numbers associated with the calling terminals T1-TN are provided by "ANI" equipment independent of any action by the caller. In the event "ANI" equipment is not available, callers may be vocally prompted to provide the digital representations by selectively depressing the buttons 14.

The telephone communication facility CO also may provide digital signals indicating the called number. Generally, such a capability involves equipment designated "DNIS". The capability may be useful in various embodiments of the present system, as to distribute calls from a single equipment as mentioned above.

Pursuing the exemplary structure of FIG. 1 in still greater detail, the communication facility CO provides three sets of trunks or lines LA1, LA2 and LA3 respectively coupled to the audio response units 18, 20 and 22. From the audio response units 18, 20 and 22, sets of lines LB1, LB2 and LB3 are connected to the coupler 24. Under control of the control unit 28, the coupler 24 connects individual lines 37 of the sets LB1, LB2 and LB3 to the processor 26 through lines 39.

Generally, the audio response units 18, 20 and 22 may take the form of well known telephonic structures with the capability to "answer" calls and interface callers in a preliminary way. Each of the units 18, 20 and 22 incorporate a voice generator along with some basic programmable logic capability.

The audio response unit 18 is coupled to a free-call memory 32. Generally, the unit 18 in cooperation with the memory 32 operates with the control unit 28 to qualify acceptable calls in the "800" mode.

The audio response unit 20 is connected to a select-number coincidence detector 34. These structures along with the control unit 28 test area-code mode calls. The audio response unit 22 accepts calls without initial qualification.

The system of the disclosed embodiment selectively qualifies callers depending on their calling mode. Additionally, the system responds to caller identification to enhance contest equity. Generally, the interface processor 26 poses questions to calling contestants and stores the resulting answers in a result memory 36. Questions given to contestants are selected from a memory 38 by a random number generator 40. Essentially, the memory 38 contains an inventory of questions addressable by numbers provided by the random number generator 40. The address numbers from the generator 40 are also supplied to a coincidence detector 42 that also receives the address numerals of questions previously presented

5,128,984

5

to a specific caller from a record 44. Thus, before a question is presented to a caller, the number of the calling terminal is checked to assure that the same question has not previously been posed to a caller at that terminal.

If the coincidence detector 42 clears the current question as not being repetitive, a gate 46 is qualified and the question is supplied from the memory 30 to the interface processor 26. A voice generator within the interface processor 26 then provides signals through a designated line 39, the coupler 24, a line 37, one of the audio response units and the communication facility CO to the connected remote terminal. As a result, the caller hears a simulated voice question. The answer is provided by the caller actuating the buttons 14 at the calling terminal. In that regard, the question may be in a multiple choice or true-false format to accommodate simple push button actions at the terminal.

In view of the above description of structural elements in the disclosed embodiment, a comprehensive understanding of the system may now best be accomplished by assuming certain operating conditions and describing the resulting operations. Accordingly, assume that the system CS is programmed to accommodate a relatively simple game format, that is, a sponsored contest for the promotion of a product, e.g. the XYZ Widget. Further assume the contest is of limited participation based either upon: the payment of a token fee ("900" calling mode), prearranged participation ("800" calling mode), lottery selection (area-code calling mode) or lottery selection in combination with either 800 or 900 calling modes. Considering exemplary possibilities of the format, the XYZ Widget might be advertised with an invitation to participate via the "900" calling mode. Alternatively, participants might be variously qualified as by select notification; however, in the exemplary format, such participants would incur a token charge imposed through "900" telephonic service. To consider an example, an offering might be stated: "If your last three phone digits are 972 you may call, 1) if you wish, call 1 900 XXXX972 (\$0.95 service charge) provided your last three phone digits are 972; 2) if you have written in for a 'free to enter' you can use the one-time PIN number provided your last three phone digits are 972. In this case you can use the 'free' 800 number provided to you with your PIN number."

As indicated above, some telephone terminals do not accommodate "900" calling mode. Also, under certain circumstances, it is important to afford members of the public "free" access to participate in various games or contests. For example, such participation might be arranged by mail or other communication to provide a participant with a limited-use (i.e. one) qualification number. With use, the numbers are stored in the memory 32 and the list is checked subsequently to avoid repeat use.

A third class of contest participants might be considered lottery winners. For example, the sponsor might televise a drawing of three decimal digits to provide a sequence of three numbers. The three numbers might identify "winning" or "entitled" participants by corresponding to the last three numbers (digits) of their telephone number. For example, the drawing of the numbers "257" would entitle a single call participation from any of the telephone terminals T1-TN designated by a number, the last three digits of which are "257".

In an exemplary contest format, participants might be asked a few test questions (for minor prizes and the

6

ability to participate in a lottery). Of course, a vast variety of possibilities exist; and in that regard, interim prizes may be awarded to participants as the format proceeds from the initial call to the ultimate prize. At the present point, it is important to appreciate that the system accommodates participants using various telephone call modes with select qualification to participate in an interface format utilizing voice prompt and push-button digital communication. In accordance with the described example, the sponsor invites participants to enter using "900" calling mode service. As a part of such an invitation, persons are advised that "free" entry or participation may be gained by sending a self-addressed envelope to receive an entry number, e.g. eight digits, for use via "800" calling mode service. In the disclosed embodiment, the eight-digit numeral is coded for verification. Of course, numerous possibilities exist. As a simple example the second and sixth digits of the number might have a specific sum, e.g. seven or seventeen. That is, the second and sixth digits might be: three and four, five and two, six and one, seven and zero, nine and eight and so on. A qualifying number would be: "34726313", the second and sixth digits being four and three, respectively.

With the arrangements completed for calling entries in the "900" and "800" mode, the contest might operate for several days before being opened to area-calling participants. That is, the area-calling mode might be available only after a televised drawing entitling participation from a select group of telephone numbers for a limited period of time.

In view of the above assumptions and descriptions, consider now the operation of the system as depicted in FIG. 1 in relation to the process diagram of FIG. 2. That is, assume the system of FIG. 1 is implemented and programmed to accommodate the exemplary operations as will now be described with reference to the process diagram of FIG. 2.

First, suppose a caller at the terminal T1 places a call in the "900" mode in response to an advertisement by a sponsor promoting XYZ Widgets. Perhaps the caller will receive at least a token gift and might qualify for a major lottery prize.

The assumed call involves the caller actuating the buttons 14 as for example to input: "1 900 5558945". As a result, signals are provided to the communication facility CO resulting in a connection from the remote terminal T1 to the audio response unit 22. With the connection, the communication system CO also provides the audio response unit 22 with digital identification signals representative of the designation for remote terminal T1 ("212 627 2222"). The identification signals are provided by the ANI equipment within the communication facility CO and are registered by the audio response unit 22. The operation is illustrated as a process step in FIG. 2 by the block 50 (upper right) for "900" mode calls.

As suggested above, it may be desirable for a format to provide a token award to all callers in the "900" mode. Recognizing such particulars as possibilities, in the disclosed embodiment, calls in the "900" mode are passed through the audio response unit 22 (FIG. 1) and the coupler 24 to the interface processor 26. Accordingly, the interface processor 26 receives the calling number and processes the contest format as described in detail below.

The initial step of the format common to all call modes is represented by the block 52 in FIG. 2. How-

7

5,128,984

ever, as calls in all modes are processed similarly from that point, before proceeding with the explanation, the preliminary operations attendant other calling modes first will be explained.

As explained above, certain accommodations are made for participation in the "800" (caller free) mode. Accordingly, assume a caller at the terminal T1 has been given an identification number: "34726313" for use in the "800" mode. Accordingly, the caller dials a number, e.g. "800 555 3478", actuating the terminal T1 and the communication facility CO to provide a connection with the audio response unit 18. With communication, the audio response unit actuates an internal voice generator prompting the caller to key in his assigned number, "34726313". As the digits of the number are keyed in by the caller, they are supplied from the audio response unit 18 to the control unit 28 and the free-call memory 32.

Within the control unit 28, logic is provided for verifying the identification number as proper. In accordance with the simple example explained above, the control unit 28 would simply sum the second and sixth digits to test for a total of "7". The coincidence test is represented by the query block 56 in FIG. 2. As indicated above, various codes and verification techniques are well known along with the apparatus for verifying assigned numbers.

If the control unit 28 validates the qualification number "34726313", it is recorded in the free-call memory 32 for future checking against repeat use. Accordingly, each call in the "800" mode also involves a check or test from the audio response unit 18 to the memory 32 to determine whether or not the assigned qualification number has been previously used. The previous-use test is illustrated as a process step by the query block 58 in FIG. 2.

If the control unit 28 determines the qualification number to be invalid or the memory 32 reveals the number has been previously used, the communication is aborted by the audio response unit 18. For example, the audio response unit 18 may be actuated to provide simulated audio signals carrying a message terminating the communication. For example, the caller might be advised: "The number you have provided is not valid. Consequently, your participation cannot be accepted on that basis."

If the entered number is valid and has not been previously used, the tests indicated by the query blocks 56 and 58 (FIG. 2) are positive and the process again proceeds to the common step as indicated by the block 52, e.g. as to receive a token gift.

As indicated above, a third possibility for contest participation involves calling in the area-code mode. While numerous format possibilities exist, as suggested above, access for callers in the area-code mode might be limited to a relatively short period of time. For example, a television program advertising the XYZ Widget might include a drawing to select the telephone terminals from which callers may participate for a period of twenty-four hours. As indicated above, the drawing might identify the last three digits of telephone numbers for the approved terminals.

Following a relatively short time (e.g. one day) during which area-code callers may enter the contest, the contest might be concluded with the ultimate winner or winners determined. In any event, assume the presence of a caller at the terminal T2 with an approved telephone number, i.e. "212 627 2257". Somewhat as ex-

8

plained above with respect to other calling modes, keying operations by the caller at the remote terminal T2 result in a connection through the communication system CO to the audio response unit 20. As previously, the communication facility CO provides digital signals to the audio response unit 20 indicating the calling number (ANI). Thus, the calling number is registered as indicated by the block 62 in FIG. 2. As previously, in the event ANI equipment is not operative to serve the remote terminal T2, then the caller may be asked to key in his telephone number for subsequent verification.

From the audio response unit 20, the caller's number is supplied to the coincidence detector and storage unit 34 for a two-stage test. A first test simply seeks a coincidence between the approved number sequence (three digits) and the last three digits of the calling number. In the example, the last three digits of the calling number ("257") are compared with the select digit sequence, "257". The test is indicated by the query block 64 in FIG. 2.

As a secondary test, the unit 34 may check a record of previous use. Thus, the unit 34 simply implements test logic to accomplish these comparison-step operations with structures as well known in the prior art.

If the tests are negative, as indicated by the query block 64, the communication is aborted as indicated by the block 60. Alternatively, a favorable test again directs the system to proceed to the step of block 52 at which the process enters a common phase for all calling modes.

With the entry of a call into the common phase, the line carrying the call is connected through the coupler 24 (FIG. 1) to the interface processor 26. That is, depending on the call mode, the call is passed through one of the audio response units 18, 20 or 22 and the coupler 24 to the interface processor 26. Note that as indicated above, each of the audio response units 18, 20 and 22 is capable of accommodating a large number of asynchronous calls. Similarly, the coupler 24 is capable of connecting lines from the audio response units 18, 20 and 22 (LB1, LB2 and LB3 respectively) to the interface processor on an individual basis through lines 37 and 39.

The interface processor 26 may comprise a relatively substantial computing capability for processing many individual calls with programmed variations. The processing operation is illustrated in FIG. 2 beginning with the block 52. However, note that as the interface processor 26 receives the telephone number identifying a calling terminal (ANI) reference may be made to a data bank. Therefore, the operation might involve reference to substantial data on a caller. Accordingly, a basis exists for several process variations accommodated by data from a bank. The block 52 represents such possibilities as well as further informing or processing callers.

With the receipt of a call at the interface processor 26, a voice generator may be actuated to specifically inform a caller, depending upon the specific format employed. Essentially, digital signals are provided to actuate a voice generator within the processor 26. Accordingly, an audio message is provided through the coupler 24, the associated audio response unit, and the communication facility CO to the connected remote terminal. Thus, the caller may be further informed or cued.

In the disclosed embodiment, concurrently with the operation of further informing the caller, the interface processor 26 actuates the random number generator 40 to provide a random address for the question memory

9

5,128,984

38. The process step is illustrated in FIG. 2 by the block 66.

The random number (identifying a question in the memory 38) is also provided to the coincidence detector 42 to test for the previous use of the question to the calling terminal. In that regard, the interface processor 26 provides the caller telephone number (ANI) to the caller record 44 which may simply take the form of a look-up table addressed by calling numbers and revealing the identification of previous questions propounded. The addresses of questions previously recorded for a calling number are supplied to the coincidence detector 42 for comparison with the current tentative question identification number. The process step is illustrated by the query block 68 in FIG. 2.

If the tentative question has been previously used for the calling terminal, a signal is provided from the coincidence detector 42 to the interface processor prompting a repeat operation by the random number generator 40 to select another question.

Alternatively, if the tentative question is not a repeat, then the coincidence detector 42 qualifies the gate 46 and the tentative question is supplied to the interface processor 26 for actual use. Note that upon the occurrence of an approved question, the coincidence detector also supplies a signal to the call record 44 which records the identification number of the question. The process step is illustrated in FIG. 2 by the block 70.

With the provision of signals representing a question through the gate 46 to the interface processor 26, the internal voice generator is actuated to propound the question to the caller. Recognizing the vast possibilities for contest formats, one or more rather difficult questions might be propounded to isolate lottery participants. Alternatively, a relatively easy question may be propounded as a minor obstacle to participation in the final phase of the contest. In any event, as prompted or cued, the caller responds using the buttons 14 and the response is registered for testing within the interface processor 26. The process steps are indicated by the block 72 and the query block 74 in FIG. 2. The results of the tests are then stored in the interface result memory 36. Note that in the interests of human perception, a printed record may be developed concurrently with the qualification of lottery participants.

Final processing to determine a winner or winners may involve any of various operations as a drawing, an event, and so on. Accordingly, as indicated by the blocks 76 and 78, final determinations are made of winners and losers with predetermined prize allocations. Thus, the system of the present invention enables effective regulation and control of interfaces between persons at telephone stations and a central processing apparatus. Calls in various modes are accommodated with appropriate tests, and interface data (e.g. test questions) are qualified.

In view of the above descriptions, it will be apparent that the disclosed embodiment is susceptible to considerable modification in the implementation of the present invention in conjunction with a telephone system to accommodate caller interface operations. Although the disclosed embodiment is directed to a contest, it will be apparent that aspects of the system may be variously embodied to accommodate any of a variety of telephone interface operations. Furthermore, it will be apparent that while the disclosed embodiment comprises specific elements and configurations, any of a variety of struc-

10

tures might well be utilized. Accordingly, the scope hereof is deemed to be as set forth in the claims below.

What is claimed is:

1. A telephone call processing system for receiving calls from a multitude of terminals in different call modes including an "800" call mode and a "900" call mode for processing to an interface format and involving digital signals associated with said terminals as for identification or data, said system comprising:

first response unit means for receiving calls in said "800" call mode;

qualification means for qualifying said calls in said "800" call mode received by said first response unit to provide qualified calls;

second response unit means for receiving calls in a second call mode;

means for processing calls in an interface format; and means for coupling said qualified calls and said calls in a second mode to said means for processing.

2. A system according to claim 1 wherein said second response unit is coupled to receive calls in said "900" call mode.

3. A system according to claim 2 wherein said qualification means comprises a test structure, for testing said digital signals associated with said terminals originating said calls in said "800" call mode.

4. A system according to claim 1 wherein said qualification means comprises means for testing said digital signals associated with said terminals originating said calls.

5. A system according to claim 4 further including a free-call memory structure tallying said digital signals associated with said "800" call mode and wherein said means for testing tests the content of said memory structure.

6. A system according to claim 5 wherein said second response unit is coupled to receive calls in said "900" call mode.

7. A system according to claim 5 wherein said qualification means comprises means for testing select digits of said digital signals associated with said terminals originating said calls in said 800 call mode.

8. A system according to claim 1 wherein said qualification means includes means for testing select digits of said digital signals associated with a calling terminal for identification.

9. A system according to claim 8 wherein said means for processing includes means for selecting interface questions for caller and record means for recording selected interface questions in association with said digital signals for identification.

10. A telephone call processing system for receiving calls from a multitude of terminals for processing to an interface format and involving digital signals associated with said terminals as for identification or data, said system comprising:

cue means for prompting question responses from said terminals in the form of digital signals as data; question selection means for selecting individual questions from a plurality of questions for actuating said cue means;

call record memory means for storing identified questions cued to said terminals, addressable by said digital signals associated with said terminals for identification;

test means for testing individual questions selected by said question selection means against questions

5,128,984

11

from said call record memory means to detect coincidence; and
control means coupled to said cue means, said selection means, said memory means and said test means, said control means for sequencing operations to select a question, test the selected question and either actuate said cue means or select another question under control of said test, said control means also including a gate structure for inhibiting the cue means in the event of selecting a question of record in said call record memory means.

11. A telephone call processing system according to claim 10 further including processing means for processing said digital signals as data.

12. A system according to claim 11 wherein said memory means stores the last three digits of numbers associated with acceptable terminals for identification and thereby controls said processing means based on acceptance of said calls.

13. A system according to claim 12 wherein at least three digits are tested based on ANI data received by said system.

14. A system according to claim 10 wherein the memory means further stores complete phone numbers in memory to prevent duplicate use.

15. A telephone interface system for individually interfacing callers at a multitude of remote terminals for voice-digital communication through a telephone communication facility, said system comprising:

communication means for establishing telephone communication with currently active callers at certain of said terminals through said telephone communication facility;

means for providing identification signals to said communication means indicative of said currently active callers, said means for providing identification signals comprising means for providing at least a portion of the digits associated with a remote terminal for identification;

memory means for storing caller cues and use indications for said caller cues in relation to said callers as identified by said identification signals;

cue means for receiving said caller cues to provide voice signals through said communication means to prompt responses from said currently active of said callers in the form of digital data signals; and

means for selecting a current caller cue from said memory means for one of said currently active callers for application to said cue means under control of said identification signals for said one of said currently active callers and said use indications in said memory means for said one of said currently active callers.

16. A system according to claim 15 wherein said means for providing at least a portion of the digits includes means for receiving automatic number identification (ANI) signals.

17. A telephone interface system for individually interfacing callers at a multitude of remote terminals for voice-digital communication through a telephone communication facility, said system comprising:

communication means for establishing telephone communication with currently active callers at certain of said terminals through said telephone communication facility;

means for providing identification signals to said communication means indicative of said currently active callers;

12

memory means for storing caller cues and use indications for said caller cues in relation to said callers as identified by said identification signals;

cue means for receiving said caller cues to provide voice signals through said communication means to prompt responses from said currently active of said callers in the form of digital data signals; and

means for selecting a current caller cue from said memory means for one of said currently active callers for application to said cue means under control of said identification signals for said one of said currently active callers and said use indications in said memory means for said one of said currently active callers, said means for selecting including means for addressing said memory means to provide a possible caller cue with use indications and coincidence means for testing said use indications for said possible caller cue against said identification signals for said one of said currently active callers.

18. A system according to claim 17 wherein said means to provide a possible caller cue includes a random number generator for addressing said memory means.

19. A telephone interface system for individually interfacing callers at a multitude of remote terminals for voice-digital communication through a telephone communication facility, said system comprising:

communication means for establishing telephone communication with currently active callers at certain of said terminals through said telephone communication facility;

means for providing identification signals to said communication means indicative of said currently active callers;

memory means for storing caller cues and use indications for said caller cues in relation to said callers as identified by said identification signals;

cue means for receiving said caller cues to provide voice signals through said communication means to prompt responses from said currently active of said callers in the form of digital data signals; and

means for selecting a current caller cue from said memory means for one of said currently active callers for application to said cue means under control of said identification signals for said one of said currently active callers and said use indications in said memory means for said one of said currently active callers, said means for selecting including means to reject a caller cue indicated to have been used for a currently active caller.

20. A telephone interface system for individually interfacing callers at a multitude of remote terminals for voice-digital communication through a telephone communication facility, said communication facility providing number identification (ANI) signals indicative of the number for a calling remote terminal, said system comprising:

preliminary communication means for establishing preliminary telephone communication with callers at said terminals to receive said number identification (ANI) signals;

memory means for storing at least one predetermined sequence of select digits representative of only a portion of at least one of the numbers for identifying remote terminals

means for testing said predetermined sequence of select digits against a select portion of a number for

5,128,984

13

a calling terminal as represented by said number identification (ANI) signals for a current caller to provide a control signal; and
means for accepting calls for interface communication beyond said preliminary telephone communication from said terminals in accordance with said control signal.

21. A telephone interface system according to claim 20 wherein said preliminary communication means comprises an audio response unit.

22. A telephone interface system according to claim 20 wherein said preliminary communication means comprises a response unit for receiving "800" mode calls.

23. A telephone call processing system for receiving calls from a multitude of terminals for processing in a lottery interface format wherein callers are cued by

14

synthesized voice signals supplied to said terminals and respond with digital signals, as by actuating push buttons at said terminals, said system comprising:

means for selectively receiving calls from said multitude of terminals to establish telephone communication with a select subset of callers, said means for selectively receiving calls comprising means for receiving calls in a plurality of calls modes including an "800" calling mode;

means for providing identification signals for said callers of said select subset;

means for individually cuing said callers of said select subset to promote digital signals for processing to isolate a sub-subset of said callers; and

means for storing identification signals for said callers of said sub-subset.

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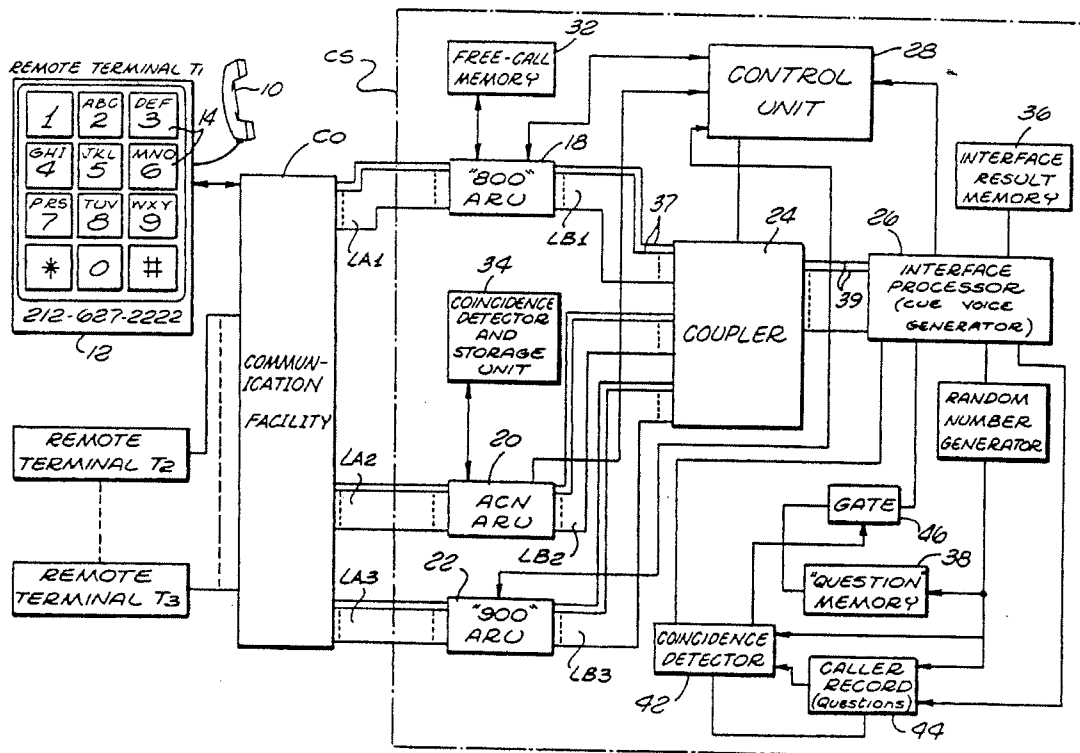
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EXHIBIT 4

[11] Patent Number: 5,251,252
[45] Date of Patent: * Oct. 5, 1993

- 18 Claims, 2 Drawing Sheets**

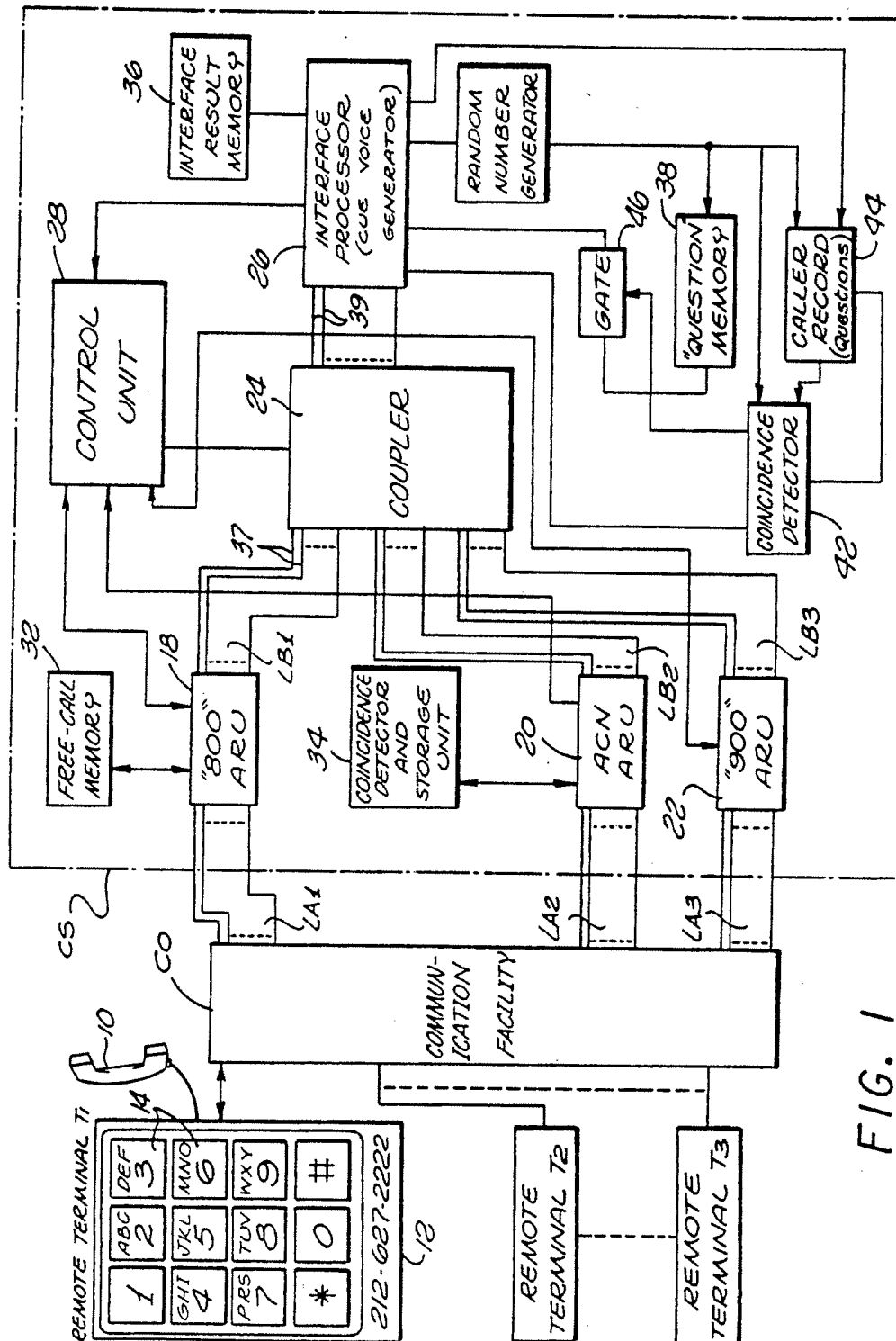


U.S. Patent

Oct. 5, 1993

Sheet 1 of 2

5,251,252



U.S. Patent

Oct. 5, 1993

Sheet 2 of 2

5,251,252

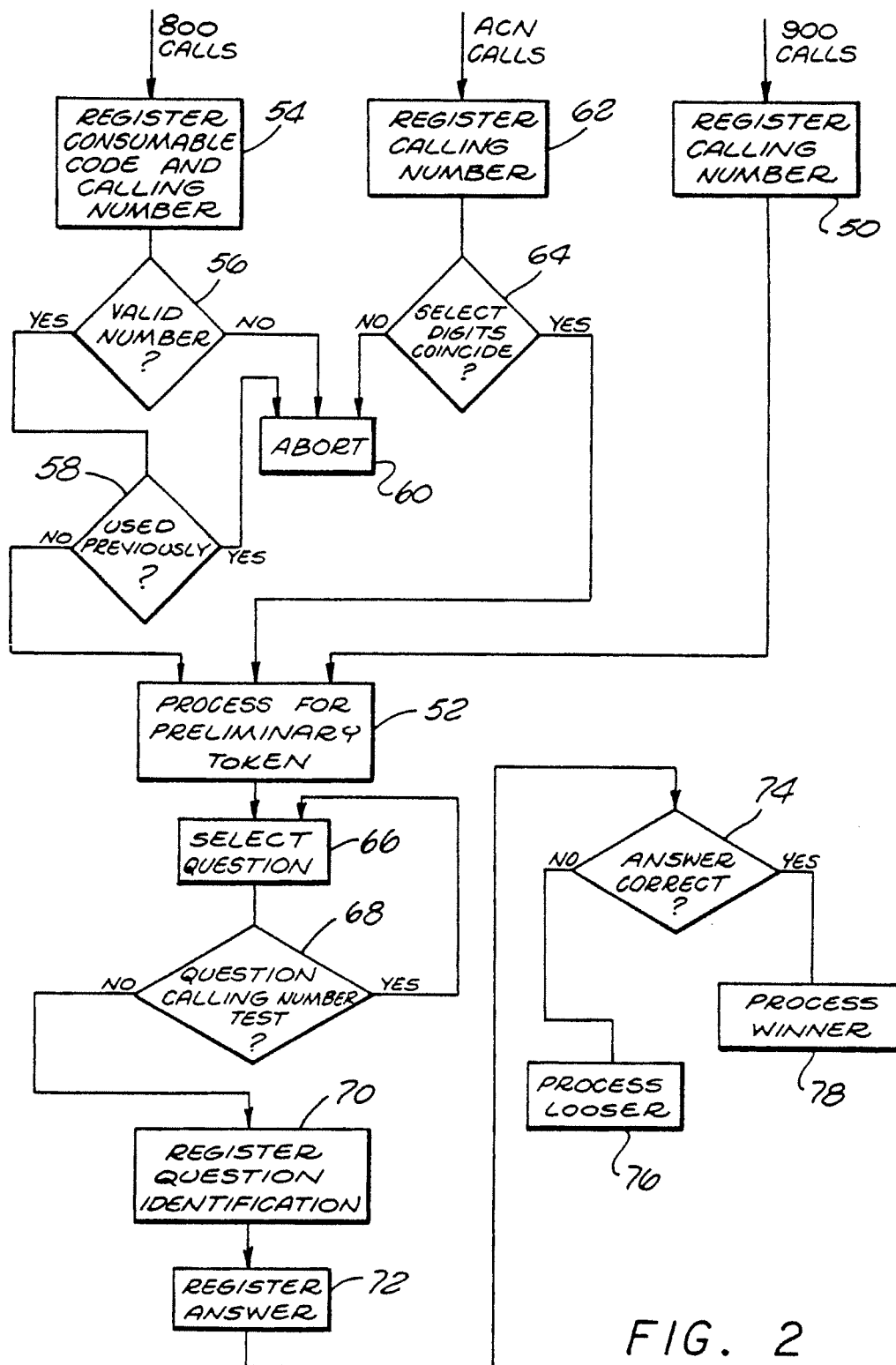


FIG. 2

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TELEPHONE INTERFACE CALL PROCESSING SYSTEM WITH CALL SELECTIVITY

This is a continuation of application Ser. No. 07/425,779 filed Oct. 23, 1989, now U.S. Pat. No. 5,128,984 which is a continuation-in-part of U.S. patent application Ser. No. 312,792 filed Feb. 21, 1989, U.S. Pat. No. 5,073,929 and entitled "Voice-Data Telephonic control System" which is a continuation-in-part of U.S. patent application Ser. No. 194,258 filed May 16, 1988, and entitled "Telephonic-Interface Statistical Analysis System", now U.S. Pat. No. 4,845,739, which is a continuation-in-part of U.S. patent application Ser. No. 018,244 filed Feb. 24, 1987, and entitled "Statistical Analysis System For Use With Public Communication Facility", now U.S. Pat. No. 4,792,968, which is a continuation-in-part of application Ser. No. 753,299 filed Jul. 10, 1985, and entitled "Statistical Analysis System For Use With Public Communication Facility", now abandoned.

BACKGROUND AND SUMMARY OF THE INVENTION

Recent years have seen a considerable growth in the use of telephonic communications. For example, in various applications, telecommunications applications have expanded to accommodate voice-digital interfaces between computer apparatus and callers at remote telephone terminals. For example, by actuating the push buttons at a remote telephone terminal, a caller controls a computer apparatus to provide various entertainment or information. In using such a system, a caller might telephone a financial service and selectively actuate the telephone key panel to receive information on specific stocks or bonds.

Digital interface systems also have been implemented to utilize digital signals provided independently of the caller's actions. For example, the so-called "ANI" telephone equipment provides digital signals indicating a caller's telephone number. Equipment designated "ID-NIS" is similarly available to indicate the called number. Thus, digital signals may be provided telephonically to a system associated with individual calling terminals as for identification or other use.

Telephonic games and contests are among the various applications that have been recognized for implementation with telephone interface systems. Such games and contests may be variously presented, as in cooperation with an advertising program for a product or in a lottery format. Generally with respect to such applications, various call modes might be utilized.

Essentially, three telephonic calling modes or services are in widespread use. Specifically, caller-charge or "900" service (including "976" calls) involves a charge to the caller for each call. The "900", calling mode is useful for implementing games and contests with telephone interface systems; however, certain problems are encountered. Specifically, certain telephone terminals, e.g. pay phones, do not accommodate "900" service. Also, with respect to certain forms of games and contests, it is important to offer members of the public an alternative "free" method of participation. In general, the system of the present invention may be employed to implement "900" calling modes while accommodating "free" participation with reasonable control.

Telephone calls may be accommodated without charge using "800" service or calling mode. Generally, the "800", calling mode accommodates free calls by callers in various areas to a particular station incurring the charges. In most applications, it is important to regulate the use of the "800" calling mode. Another calling mode is the traditional method of calling, involving area-code numbers which also includes calls placed within a given area code which do not usually involve a specific charge and usually do not require dialing the area code. One of the problems associated with using the area-code calling mode for interface systems is the vast number of calls. For example, even in association with an advertising campaign, inviting members of the general public to participate in a free contest or game by telephone may prompt an overwhelming response. Accordingly, a need exists for a practical system to control and limit calls to an interface-service in the traditional free area-code number mode.

Another aspect of telephonic-interface contests involves zealous or obsessive participants. For example, in a quiz contest, a zealous person might call repeatedly, researching answers to given questions until ultimately a question is repeated. At that time, the caller is ready with an answer and has an unfair advantage in the contest. Thus, a need exists for control within the interface system.

In general, the system of the present invention involves a telephone call processing system for receiving calls from a multitude of terminals in different call modes and for processing calls, as to a game or contest format, with means to limit repeat-call advantages. In a disclosed form, the system implements three calling modes to facilitate various formats while accomplishing certain protection both with regard to the calling mode and contest formats.

BRIEF DESCRIPTION OF THE DRAWINGS

In the drawings, which constitute a part of this specification, exemplary embodiments exhibiting various objectives and features hereof are set forth, specifically:

FIG. 1 is a block diagram of a system constructed in accordance with the present invention; and

FIG. 2 is a flow diagram of an operating format of the system of FIG. 1.

DESCRIPTION OF THE ILLUSTRATIVE EMBODIMENT

As required, a detailed illustrative embodiment of the present invention is disclosed herein. However, telephone techniques, physical communication systems, data formats and operating structures in accordance with the present invention may be embodied in a wide variety of forms and modes, some of which may be quite different from those of the disclosed embodiment. Consequently, the specific structural and functional details disclosed herein are merely representative, yet in that regard, they are deemed to afford the best embodiment for purposes of disclosure and to provide a basis for the claims herein which define the scope of the present invention.

Referring initially to FIG. 1, a series of remote terminals TL-TN (telephone instruments) are represented (left). The terminals TL-TN may be functionally similar and accordingly only the terminal T1 is shown in any detail. The indicated terminals TL-TN represent the multitude of telephone terminals existing in association

3

5,251,252

4

with a communication facility CO which may comprise a comprehensive public telephone network.

The communication facility CO, accommodating the individual terminals TL-TN, is coupled to a central processing station CS generally indicated within a dashed-line block. In the station CS, to illustrate operating aspects of the present invention, calls are selectively accepted and interfaced so as to accomplish a desired operating format, for example a contest or game.

Generally, calls from the individual terminals TL-TN might be in any of three modes, i.e. the "800" mode, the "900" mode or the area-code mode (traditional area code plus number or local number dialing). In the disclosed illustrative system, depending on individual calling modes, calls are selectively accepted for interface processing. Generally, the interface format accommodates "900" calls with supplemental "800" calls to accommodate both "free" access and all types of telephone terminals. In the disclosed embodiment, calls in the "800" mode are restricted in accordance with prearranged limitations. Furthermore, calls in the area-code mode (from all areas), the 800 mode and 900 mode may be limited to callers having a station number containing a predetermined digit sequence. For example, calls might be restricted to those from terminals having a telephone number ending in the digits "234".

The processing station CS also is controlled to limit the effectiveness of zealous callers. For example, in a contest format, callers may be quizzed with questions randomly drawn from an inventory. In accordance herewith, questions are not repeated to individual telephone terminals T1-TN. Thus, some control is imposed on an aggressive caller who might otherwise be given two opportunities to answer the same question.

Considering the system of FIG. 1 in greater detail, the exemplary telephone terminal T1 includes a handpiece 10 (microphone and earphone) and a panel 12 provided with a rectangular array of individual push buttons 14 in a conventional configuration. Of course, the handpiece 10 accommodates analog signals while the panel 12 is a digital apparatus. During an interface operation, as disclosed in detail below, the caller is queued or prompted vocally through the handpiece 10 (earphone) to provide digital responses using the buttons 14.

At this stage, some specific aspects of the communication interface are noteworthy. Essentially, as a result of telephonic dialing at one of the terminals TL-TN, the communication facility CO couples the select terminal to an audio response unit. Specifically, to illustrate various aspects, three separate audio response units are provided in the station CS to accept calls in the three distinct modes. That is, an audio response unit 18 receives calls in the "800" mode. An audio response unit 20 receives calls in the area-code dialing mode, and an audio response unit 22 receives calls in the "900" dialing mode.

It will be understood that although three separate audio response units are illustrated, systems incorporating the principles of the present invention may well incorporate various numbers of audio response units for each calling mode, with each audio response unit having the capability to accommodate a substantial number of calls as indicated by the lines from the communication facility CO in FIG. 1. Alternatively, a single composite unit might be utilized. Also, the mode or aspects of the described embodiment might well be implemented singly or in various combinations. Herein, for

purposes of explanation, calls are treated individually and processed accordingly through the three audio response units 18, 20 and 22.

Generally, the audio response units 18, 20 and 22 connect callers at remote terminals TL-TN from the communication facility CO through a coupler 24 (FIG. 1, station CS, center) to an interface processor 26. Both the coupler 24 and the processor 26 are connected to a control unit 28 that is also connected to the audio response units 18, 20 and 22. Accordingly, with overall supervision by the control unit 28, the audio response units 18, 20 and 22 answer and preliminarily qualify callers from the terminals TL-TN for connection through the coupler 24 to the interface processor 26.

Upon completion of an interface connection in the disclosed embodiment, a contest format is executed by vocally prompting callers to respond with digital data. At this point, it is noteworthy that the communication facility CO also provides identification signals to the audio response units 18, 20 and 22. Specifically, digital identification signals representing numbers associated with the calling terminals TL-TN are provided by "ANI" equipment independent of any action by the caller. In the event "ANI" equipment is not available, callers may be vocally prompted to provide the digital representations by selectively depressing the buttons 14.

The telephone communication facility CO also may provide digital signals indicating the called number. Generally, such a capability involves equipment designated "DNIS". The capability may be useful in various embodiments of the present system, as to distribute calls from a single equipment as mentioned above.

Pursuing the exemplary structure of FIG. 1 in still greater detail, the communication facility CO provides three sets of trunks or lines LA1, LA2 and LA3 respectively coupled to the audio response units 18, 20 and 22. From the audio response units 18, 20 and 22, sets of lines LB1, LB2 and LB3 are connected to the coupler 24. Under control of the control unit 28, the coupler 24 connects individual lines 37 of the sets LB1, LB2 and LB3 to the processor 26 through lines 39.

Generally, the audio response units 18, 20 and 22 may take the form of well known telephonic structures with the capability to "answer" calls and interface callers in a preliminary way. Each of the units 18, 20 and 22 incorporate a voice generator along with some basic programmable logic capability.

The audio response unit 18 is coupled to a free-call memory 32. Generally, the unit 18 in cooperation with the memory 32 operates with the control unit 28 to qualify acceptable calls in the "800" mode.

The audio response unit 20 is connected to a select-number coincidence detector 34. These structures along with the control unit 28 test area-code mode calls. The audio response unit 22 accepts calls without initial qualification.

The system of the disclosed embodiment selectively qualifies callers depending on their calling mode. Additionally, the system responds to caller identification to enhance contest equity. Generally, the interface processor 26 poses questions to calling contestants and stores the resulting answers in a result memory 36. Questions given to contestants are selected from a memory 38 by a random number generator 40. Essentially, the memory 38 contains an inventory of questions addressable by numbers provided by the random number generator 40. The address numbers from the generator 40 are also supplied to a coincidence detector 42 that also receives

5,251,252

5

the address numerals of questions previously presented to a specific caller from a record 44. Thus, before a question is presented to a caller, the number of the calling terminal is checked to assure that the same question has not previously been posed to a caller at that terminal.

If the coincidence-detector 42 clears the current question as not being repetitive, a gate 46 is qualified and the question is supplied from the memory 30 to the interface processor 26. A voice generator within the interface processor 26 then provides signals through a designated line 39, the coupler 24, a line 37, one of the audio response units and the communication facility CO to the connected remote terminal. As a result, the caller hears a simulated voice question. The answer is provided by the caller actuating the buttons 14 at the calling terminal. In that regard, the question may be in a multiple choice or true-false format to accommodate simple push button actions at the terminal.

In view of the above description of structural elements in the disclosed embodiment, a comprehensive understanding of the system may now best be accomplished by assuming certain operating conditions and describing the resulting operations. Accordingly, assume that the system CS is programmed to accommodate a relatively simple game format, that is, a sponsored contest for the promotion of a product, e.g. the XYZ Widget. Further assume the contest is of limited participation based either upon: the payment of a token fee ("900" calling mode), prearranged participation ("800" calling mode), lottery selection (area-code calling mode) or lottery selection in combination with either 800 or 900 calling modes. Considering exemplary possibilities of the format, the XYZ Widget might be advertised with an invitation to participate via the "900" calling mode. Alternatively, participants might be variously qualified as by select notification; however, in the exemplary format, such participants would incur a token charge imposed through "900" telephonic service. To consider an example, an offering might be stated: "If your last three phone digits are 972 you may call, 1) if you wish, call 1 900 XXXX972 (\$0.95 service charge) provided your last three phone digits are 972; 2) if you have written in for a 'free to enter' you can use the one-time PIN number provided your last three phone digits are 972. In this case you can use the 'free' 800 number provided to you with your PIN number."

As indicated above, some telephone terminals do not accommodate "900" calling mode. Also, under certain circumstances, it is important to afford members of the public "free" access to participate in various games or contests. For example, such participation might be arranged by mail or other communication to provide a participant with a limited-use (i.e. One) qualification number. With use, the numbers are stored in the memory 32 and the list is checked subsequently to avoid repeat use.

A third class of contest participants might be considered lottery winners. For example, the sponsor might televise a drawing of three decimal digits to provide a sequence of three numbers. The three numbers might identify "winning" or "entitled" participants by corresponding to the last three numbers (digits) of their telephone number. For example, the drawing of the numbers "257" would entitle a single call participation from any of the telephone terminals TL-TN designated by a number, the last three digits of which are "257".

6

In an exemplary contest format, participants might be asked a few test questions (for minor prizes and the ability to participate in a lottery). of course, a vast-variety of possibilities exist; and in that regard, interim prizes may be awarded to participants as the format proceeds from the initial call to the ultimate prize. At the present point, it is important to appreciate that the system accommodates participants using various telephone call modes with select qualification to participate in an interface format utilizing voice prompt and push-button digital communication. In accordance with the described example, the sponsor invites participants to enter using "900" calling mode service. As a part of such an invitation, persons are advised that "free" entry or participation may be gained by sending a self-addressed envelope to receive an entry number, e.g. eight digits, for use via "800" calling mode service. In the disclosed embodiment, the eight-digit numeral is coded for verification. Of course, numerous possibilities exist. As a simple example the second and sixth digits of the number might have a specific sum, e.g. seven or seventeen. That is, the second and sixth digits might be: three and four, five and two, six and one, seven and zero, nine and eight and so on. A qualifying number would be: "34726313", the second and sixth digits being four and three, respectively.

With the arrangements completed for calling entries in the "900" and "800" mode, the contest might operate for several days before being opened to area-calling participants. That is, the area-calling mode might be available only after a televised drawing entitling participation from a select group of telephone numbers for a limited period of time.

In view of the above assumptions and descriptions, consider now the operation of the system as depicted in FIG. 1 in relation to the process diagram of FIG. 2. That is, assume the system of FIG. 1 is implemented and programmed to accommodate the exemplary operations as will now be described with reference to the process diagram of FIG. 2.

First, suppose a caller at the terminal T1 places a call in the "900" mode in response to an advertisement by a sponsor promoting XYZ Widgets. Perhaps the caller will receive at least a token gift and might qualify for a major lottery prize.

The assumed call involves the caller actuating the buttons 14 as for example to input: "1 900 5558945". As a result, signals are provided to the communication facility co resulting in a connection from the remote terminal T1 to the audio response unit 22. With the connection, the communication system co also provides the audio response unit 22 with digital identification signals representative of the designation for remote terminal T1 ("212 627 2222"). The identification signals are provided by the ANI equipment within the communication facility CO and are registered by the audio response unit 22. The operation is illustrated as a process step in FIG. 2 by the block 50 (upper right) for "900" mode calls.

As suggested above, it may be desirable for a format to provide a token award to all callers in the "900" mode. Recognizing such particulars as possibilities, in the disclosed embodiment, calls in the "900" mode are passed through the audio response unit 22 (FIG. 1) and the coupler 24 to the interface processor 26. Accordingly, the interface processor 26 receives the calling number and processes the contest format as described in detail below.

5,251,252

7

The initial step of the format common to all call modes is represented by the block 52 in FIG. 2. However, as calls in all modes are processed similarly from that point, before proceeding with the explanation, the preliminary operations attendant other calling modes first will be explained.

As explained above, certain accommodations are made for participation in the "800" (caller free) mode. Accordingly, assume a caller at the terminal T1 has been given an identification number: "34726313" for use in the "800" mode. Accordingly, the caller dials a number, e.g. "800 555 3478", actuating the terminal T1 and the communication facility Co to provide a connection with the audio response unit 18. With communication, the audio response unit actuates an internal voice generator prompting the caller to key in his assigned number, "34726313". As the digits of the number are keyed in by the caller, they are supplied from the audio response unit 18 to the control unit 28 and the free-call memory 32.

Within the control unit 28, logic is provided for verifying the identification number as proper. In accordance with the simple example explained above, the control unit 28 would simply sum the second and sixth digits to test for a total of "7". The coincidence test is represented by the query block 56 in FIG. 2. As indicated above, various codes and verification techniques are well known along with the apparatus for verifying assigned numbers.

If the control-unit 28 validates the qualification number "34726313", it is recorded in the free-call memory 32 for future checking against repeat use. Accordingly, each call in the "800" mode also involves a check or test from the audio response unit 18 to the memory 32 to determine whether or not the assigned qualification number has been previously used. The previous-use test is illustrated as a process step by the query block 58 in FIG. 2.

If the control unit 28 determines the qualification number to be invalid or the memory 32 reveals the number has been previously used, the communication is aborted by the audio response unit 18. For example, the audio response unit 18 may be actuated to provide simulated audio signals carrying a message terminating the communication. For example, the caller might be advised: "The number you have provided is not valid. Consequently, your participation cannot be accepted on that basis."

If the entered number is valid and has not been previously used, the tests indicated by the query blocks 56 and 58 (FIG. 2) are positive and the process again proceeds to the common step as indicated by the block 52, e.g. as to receive a token gift.

As indicated above, a third possibility for contest participation involves calling in the area-code mode. While numerous format possibilities exist, as suggested above, access for callers in the area-code mode might be limited to a relatively short period of time. For example, a television program advertising the XYZ Widget might include a drawing to select the telephone terminals from which callers may participate for a period of twenty-four hours. As indicated above, the drawing might identify the last three digits of telephone numbers for the approved terminals.

Following a relatively short time (e.g. One day) during which area-code callers may enter the contest, the contest might be concluded with the ultimate winner or winners determined. In any event, assume the presence

8

of a caller at the terminal T2 with an approved telephone number, i.e. "212 627 2257". Somewhat as explained above with respect to other calling modes, keying operations by the caller at the remote terminal T2 result in a connection through the communication system CO to the audio response unit 20. As previously, the communication facility CO provides digital signals to the audio response unit 20 indicating the calling number (ANI). Thus, the calling number is registered as indicated by the block 62 in FIG. 2. As previously, in the event ANI equipment is not operative to serve the remote terminal T2, then the caller may be asked to key in his telephone number for subsequent verification.

From the audio response unit 20, the caller's number is supplied to the coincidence detector and storage unit 34 for a two-stage test. A first test simply seeks a coincidence between the approved number sequence (three digits) and the last three digits of the calling number. In the example, the last three digits of the calling number ("257") are compared with the select digit sequence, "257". The test is indicated by the query block 64 in FIG. 2.

As a secondary test, the unit 34 may check a record of previous use. Thus, the unit 34 simply implements test logic to accomplish these comparison-step operations with structures as well known in the prior art.

If the tests are negative, as indicated by the query block 64, the communication is aborted as indicated by the block 60. Alternatively, a favorable test again directs the system to proceed to the step of block 52 at which the process enters a common phase for all calling modes.

With the entry of a call into the common phase, the line carrying the call is connected through the coupler 24 (FIG. 1) to the interface processor 26. That is, depending on the call mode, the call is passed through one of the audio response units 18, 20 or 22 and the coupler 24 to the interface processor 26. Note that as indicated above, each of the audio response units 18, 20 and 22 is capable of accommodating a large number of asynchronous calls. Similarly, the coupler 24 is capable of connecting lines from the audio response units 18, 20 and 22 (LB1, LB2 and LB3 respectively) to the interface processor on an individual basis through lines 37 and 39.

The interface processor 26 may comprise a relatively substantial computing capability for processing many individual calls with programmed variations. The processing operation is illustrated in FIG. 2 beginning with the block 52. However, note that as the interface processor 26 receives the telephone number identifying a calling terminal (ANI) reference may be made to a data bank. Therefore, the operation might involve reference to substantial data on a caller. Accordingly, a basis exists for several process variations accommodated by data from a bank. The block 52 represents such possibilities as well as further informing or processing callers.

With the receipt of a call at the interface processor 26, a voice generator may be actuated to specifically inform a caller, depending upon the specific format employed. Essentially, digital signals are provided to actuate a voice generator within the processor 26. Accordingly, an audio message is provided through the coupler 24, the associated audio response unit, and the communication facility CO to the connected remote terminal. Thus, the caller may be further informed or cued.

In the disclosed embodiment, concurrently with the operation of further informing the caller, the interface

5,251,252

9

processor 26 actuates the random number generator 40 to provide a random address for the question memory 38. The process step is illustrated in FIG. 2 by the block 66.

The random number (identifying a question in the memory 38) is also provided to the coincidence detector 42 to test for the previous use of the question to the calling terminal. In that regard, the interface processor 26 provides the caller telephone number (ANI) to the caller record 44 which may simply take the form of a look-up table addressed by calling numbers and revealing the identification of previous questions propounded. The addresses of questions previously recorded for a calling number are supplied to the coincidence detector 42 for comparison with the current tentative question identification number. The process step is illustrated by the query block 68 in FIG. 2.

If the tentative question has been previously used for the calling terminal, a signal is provided from the coincidence detector 42 to the interface processor prompting a repeat operation by the random number generator 40 to select another question.

Alternatively, if the tentative question is not a repeat, then the coincidence detector 42 qualifies the gate 46 and the tentative question is supplied to the interface processor 26 for actual use. Note that upon the occurrence of an approved question, the coincidence detector also supplies a signal to the call record 44 which records the identification number of the question. The process step is illustrated in FIG. 2 by the block 70.

With the provision of signals representing a question through the gate 46 to the interface processor 26, the internal voice generator is actuated to propound the question to the caller. Recognizing the vast possibilities for contest formats, one or more rather difficult questions might be propounded to isolate lottery participants. Alternatively, a relatively easy question may be propounded as a minor obstacle to participation in the final phase of the contest. In any event, as prompted or cued, the caller responds using the buttons 14 and the response is registered for testing within the interface processor 26. The process steps are indicated by the block 72 and the query block 74 in FIG. 2. The results of the tests are then stored in the interface result memory 36. Note that in the interests of human perception, a printed record may be developed concurrently with the qualification of lottery participants.

Final processing to determine a winner or winners may involve any of various operations as a drawing, an event, and so on. Accordingly, as indicated by the blocks 76 and 78, final determinations are made of winners and losers with predetermined prize allocations. Thus, the system of the present invention enables effective regulation and control of interfaces between persons at telephone stations and a central processing apparatus. Calls in various modes are accommodated with appropriate tests, and interface data (e.g. test questions) are qualified.

In view of the above descriptions, it will be apparent that the disclosed embodiment is susceptible to considerable modification in the implementation of the present invention in conjunction with a telephone system to accommodate caller interface operations. Although the disclosed embodiment is directed to a contest, it will be apparent that aspects of the system may be variously embodied to accommodate any of a variety of telephone interface operations. Furthermore, it will be apparent that while the disclosed embodiment comprises specific

10

elements and configurations, any of a variety of structures might well be utilized. Accordingly, the scope hereof is deemed to be as set forth in the claims below. What is claimed is:

1. A telephone interface system for individually interfacing callers at a multitude of remote terminals for voice-digital communication through a telephone communication facility, said system comprising:

communication means for establishing telephone communication with currently active callers at certain of said terminals through said telephone communication facility;

means for providing identification signals to said communication means indicative of said currently active callers;

memory means for storing caller cues and use indications for said caller cues in relation to said callers as identified by said identification signals;

cue means for receiving said caller cues to provide voice signals through said communication means to prompt responses from said currently active callers in the form of digital data signals; and

means for selecting a caller cue for said currently active caller from said memory means for application to said cue means under control of said identification signals and said use indications in said memory means for said one of said currently active callers whereby to limit caller cues provided to individual callers for avoiding duplication.

2. A system according to claim 1 further including means to process said digital data signals.

3. A telephone call processing system for receiving calls from a multitude of terminals for processing in a lottery interface format wherein callers are cued by synthesized voice signals supplied to said terminals and respond with digital signals, as by actuating push buttons at said terminals, said system comprising:

means for selectively receiving calls from said multitude of terminals to establish telephone communication with a select subset of callers;

means for generating identification signals for specifically identifying each of said callers of said select subset;

means for individually cuing said callers of said select subset to prompt digital signals for processing to isolate a sub-subset of said callers; and

means for storing said identification signals for said callers of said sub-subset.

4. A telephone call processing system for receiving calls from a multitude of terminals in different call modes including an "800" call mode and a "900" call mode for processing to an interface format and involving digital signals provided by said terminals as for identification or data, said system comprising:

first response unit means for receiving calls in said "800" call mode;

qualification means for qualifying said calls in said "800" call mode received by said first response unit to provide qualified calls, said qualification means comprising means for testing said digital signals originating said calls in said "800" call mode, said qualification means also including a limited-use pin number to facilitate participation by mail, said limited-use pin number including data consisting of said tested digital signals;

second response unit means for receiving calls in a second call mode;

means for processing calls in an interface format; and

5,251,252

11

means for coupling said qualified calls and said calls in a second mode to said means for processing.

5. A system according to claim 4 wherein said limited-use pin number allows at least a single consumable use and includes a check digit to be tested for further qualification.

6. A system according to claim 4 wherein a memory stores digital answer signals provided by a caller in response to questions posed by an interface processor.

7. A system according to claim 6 wherein identification data provided by said caller is stored in said memory, said digital answer signals being stored when said answer signals are correct.

8. A system according to claim 7 wherein said caller identification data includes caller telephone number data.

9. A telephone call processing system for receiving calls from a multitude of terminals for processing to an interface format and involving digital signals associated with said terminals as for identification or data, said system comprising:

cue means for prompting question responses from said terminals in the form of digital signals as data; question selection means for selecting individual questions from a plurality of questions for actuating said cue means,

call record memory means for storing identified questions cued to said terminals, addressable by said digital signals associated with said terminals for identification;

test means for testing individual questions selected by said question selection means against questions from said call record memory means to detect coincidence; and

means for receiving automatic number identification (ANI) data, said data for testing individual questions selected by said question selection means against questions from said call record memory means to detect coincidence;

control means coupled to said cue means, said selection means, said memory means and said test means, said control means for sequencing operations to select a question, test the selected question and either actuate said cue means or select another question under control of said test, said control means also including a gate structure for inhibiting the cue means in the event of selecting a question of record in said call record memory means.

10. A telephone call processing system as defined in claim 9, further comprising:
"900" call response means for receiving calls in a "900" call mode.

11. A telephone call processing system as defined in claim 9, further comprising:

12

"800" call response means for receiving calls in an "800" call mode; and

qualification means for qualifying calls in said "800" mode to provide qualified calls.

12. A telephone call processing system as defined in claim 11, wherein said qualification means test select digits of said digital signals associated with said calling terminals.

13. A telephone call processing system for receiving calls from a multitude of terminals for processing in a contest interface format wherein callers are cued by synthesized voice signals supplied to said terminals and respond with digital signals, as by actuating push buttons at said terminals, said system comprising:

means for receiving calls from said multitude of terminals and establishing telephone communication to select a subset of callers based upon online responses provided by said select subset of callers to contest questions, said means for receiving calls comprising means for receiving calls in a plurality of call modes including an "800" calling mode;

means for providing identification signals for said callers of said select subset; and

means for processing data relating to said callers of said select subset to isolate a sub-subset of said callers.

14. A telephone call processing system according to claim 13 wherein a random number generator is used to isolate said select sub-subset.

15. A telephone call processing system according to claim 13 wherein at least the "800" callers are limited to a one time use.

16. A process for receiving calls from a multitude of terminals in different call modes including an "800" call mode and a "900" call mode and processing to an interface format, wherein the process involves digital signals provided by said terminals as for identification or data, comprising the steps of:

receiving calls in said "800" call mode;

providing a limited-use pin number to facilitate free participation via said "800" call mode;

qualifying said calls in said "800" call mode based on said limited-use pin number to provide qualified calls;

receiving calls in said "900" call mode; and

coupling said qualified calls and said calls in said "900" mode for processing to said interface format.

17. A process for receiving calls according to claim 16 wherein at least the "800" callers are limited to a one time use.

18. A process for receiving calls according to claim 16 wherein said limited-use qualification number is coded for verification.

* * * * *

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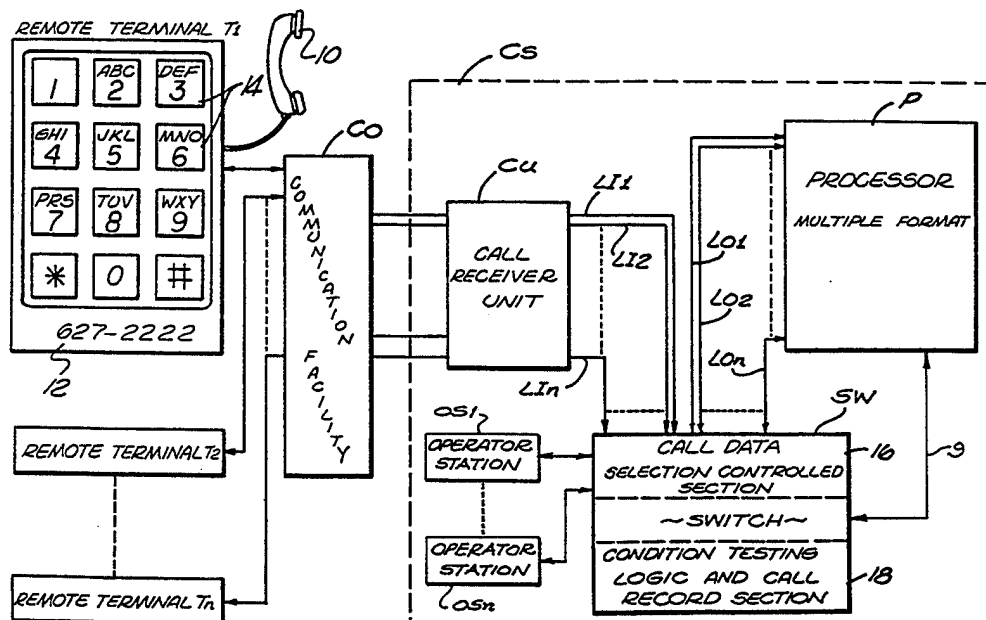
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EXHIBIT 5

[11] **Patent Number:** 5,351,285
[45] **Date of Patent:** Sep. 27, 1994

- 67 Claims, 5 Drawing Sheets**

- | | | | |
|-----------|---------|---------------------|--------|
| 4,320,256 | 3/1982 | Freeman . | |
| 4,757,267 | 7/1988 | Riskin | 379/97 |
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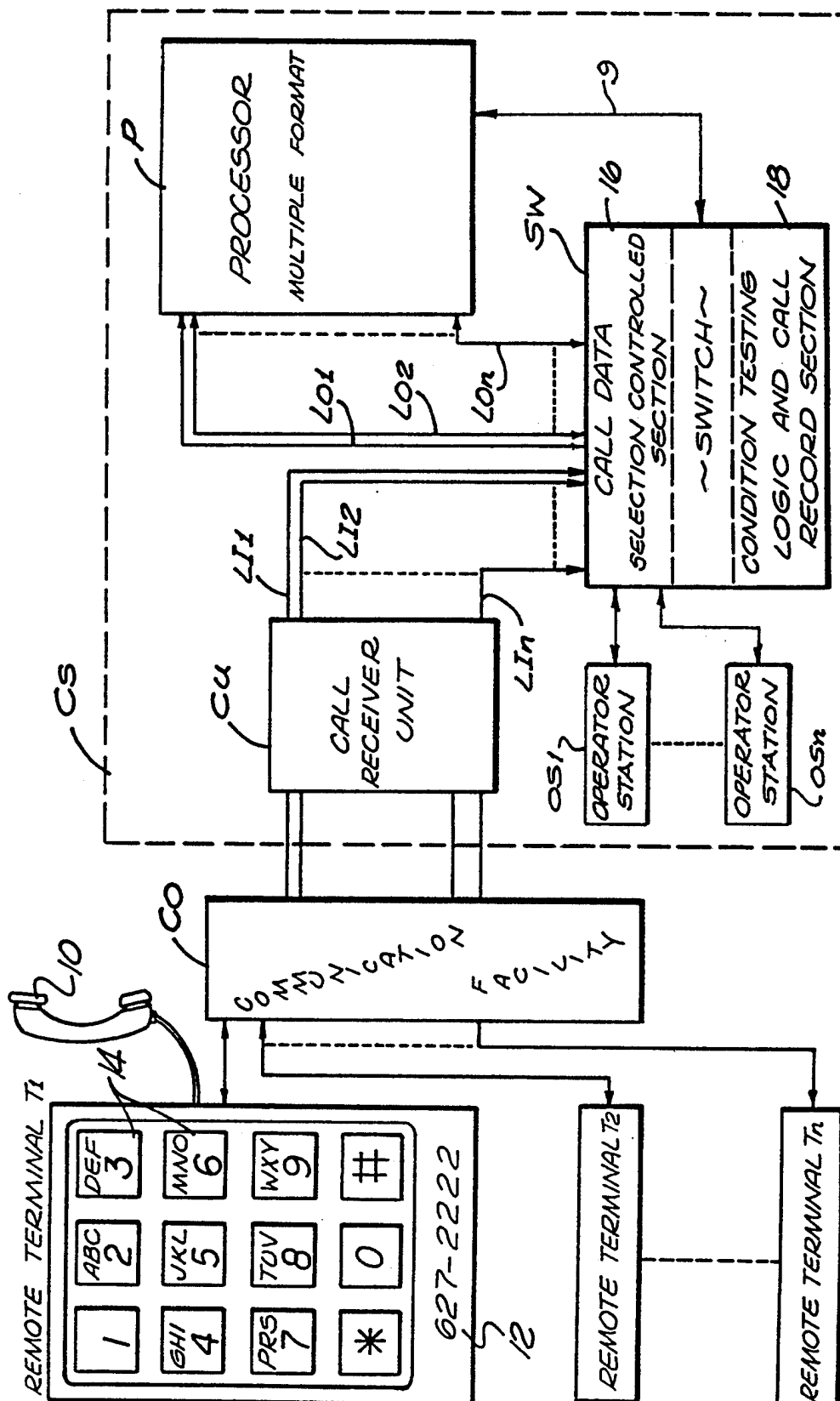


FIG. 1

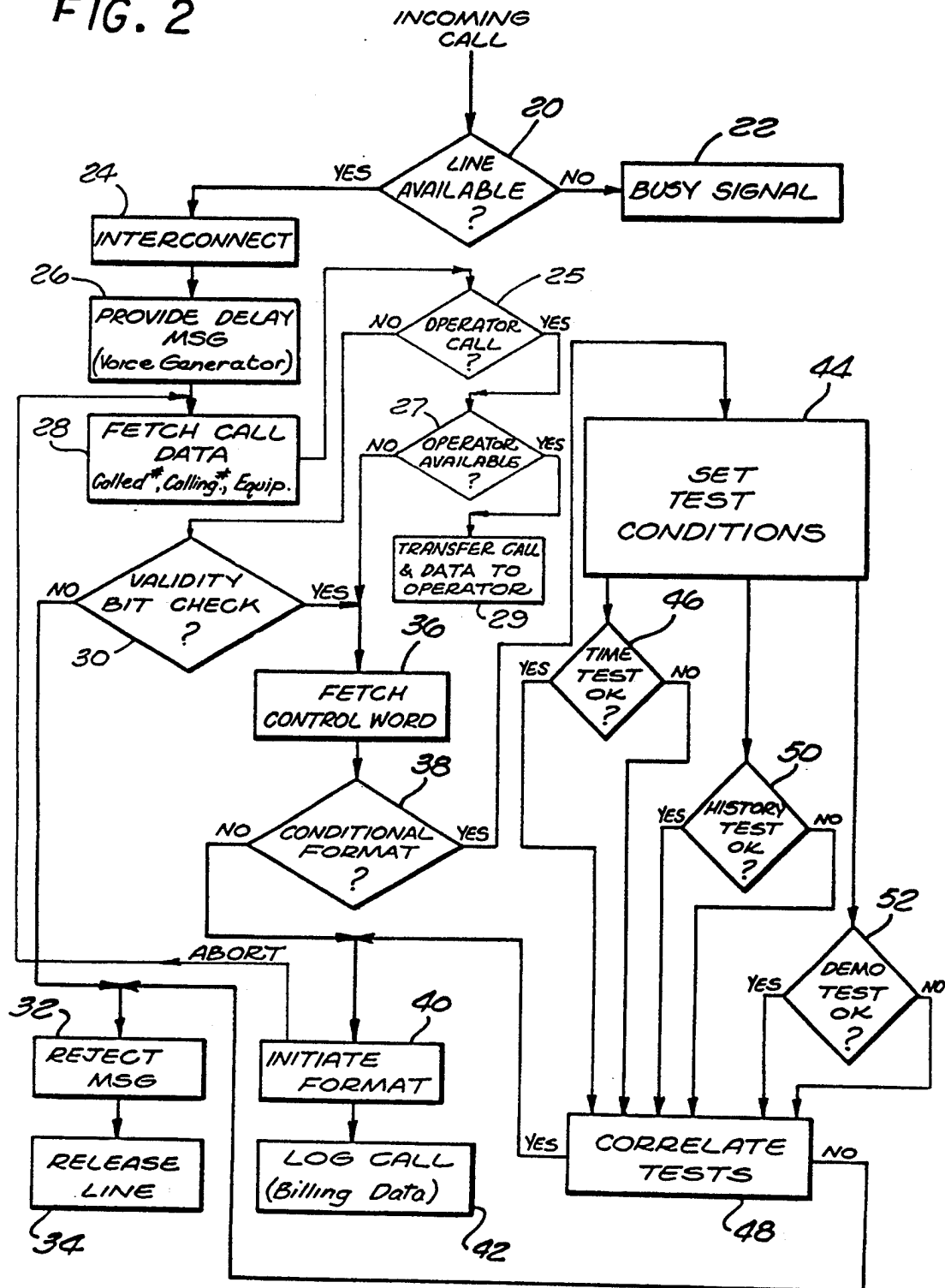
U.S. Patent

Sep. 27, 1994

Sheet 2 of 5

5,351,285

FIG. 2



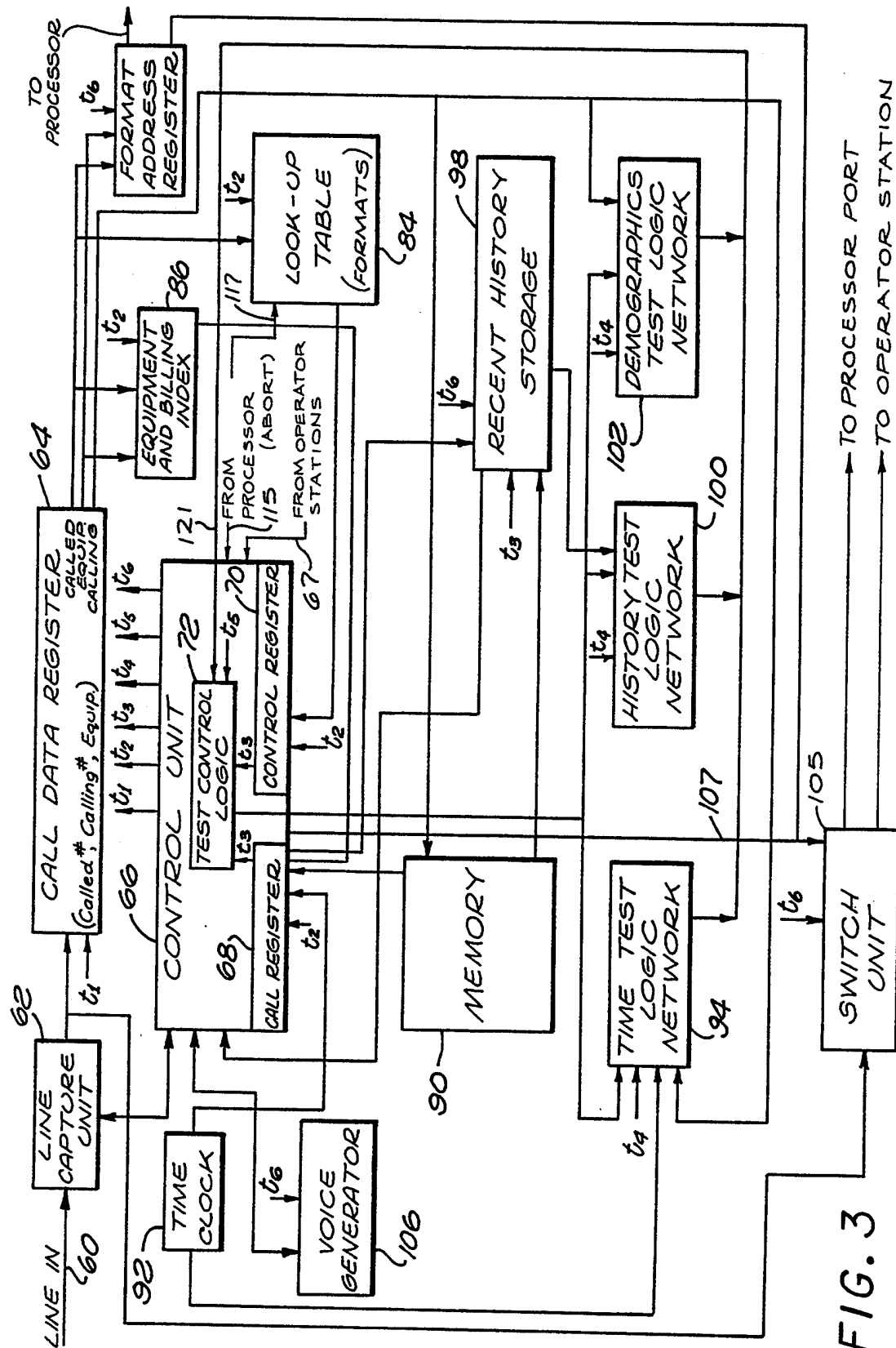


FIG. 3

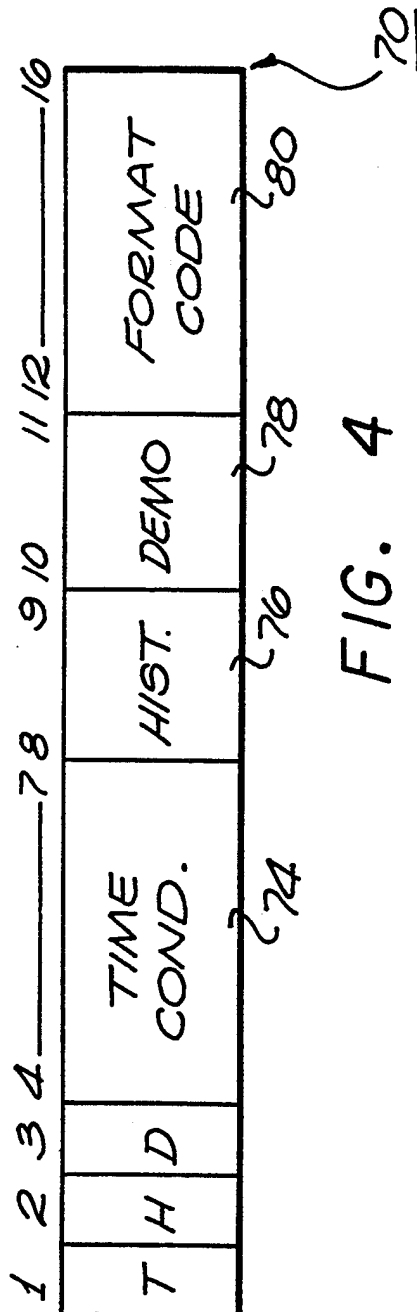
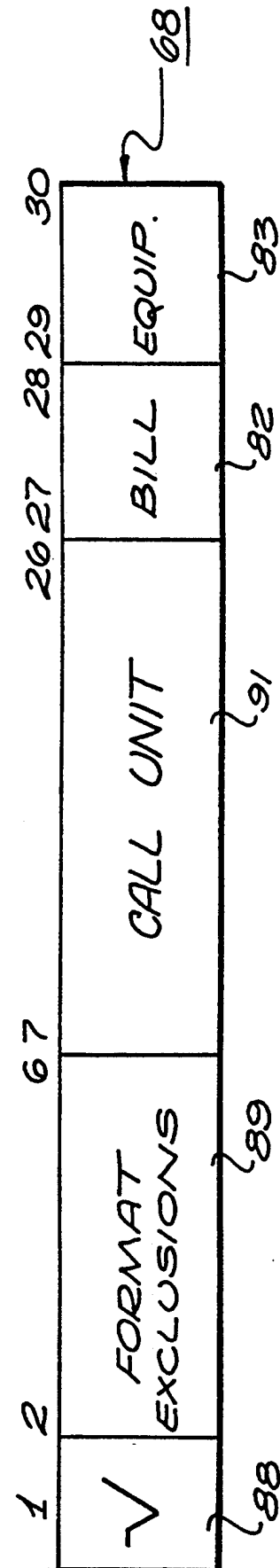


FIG. 5



U.S. Patent

Sep. 27, 1994

Sheet 5 of 5

5,351,285

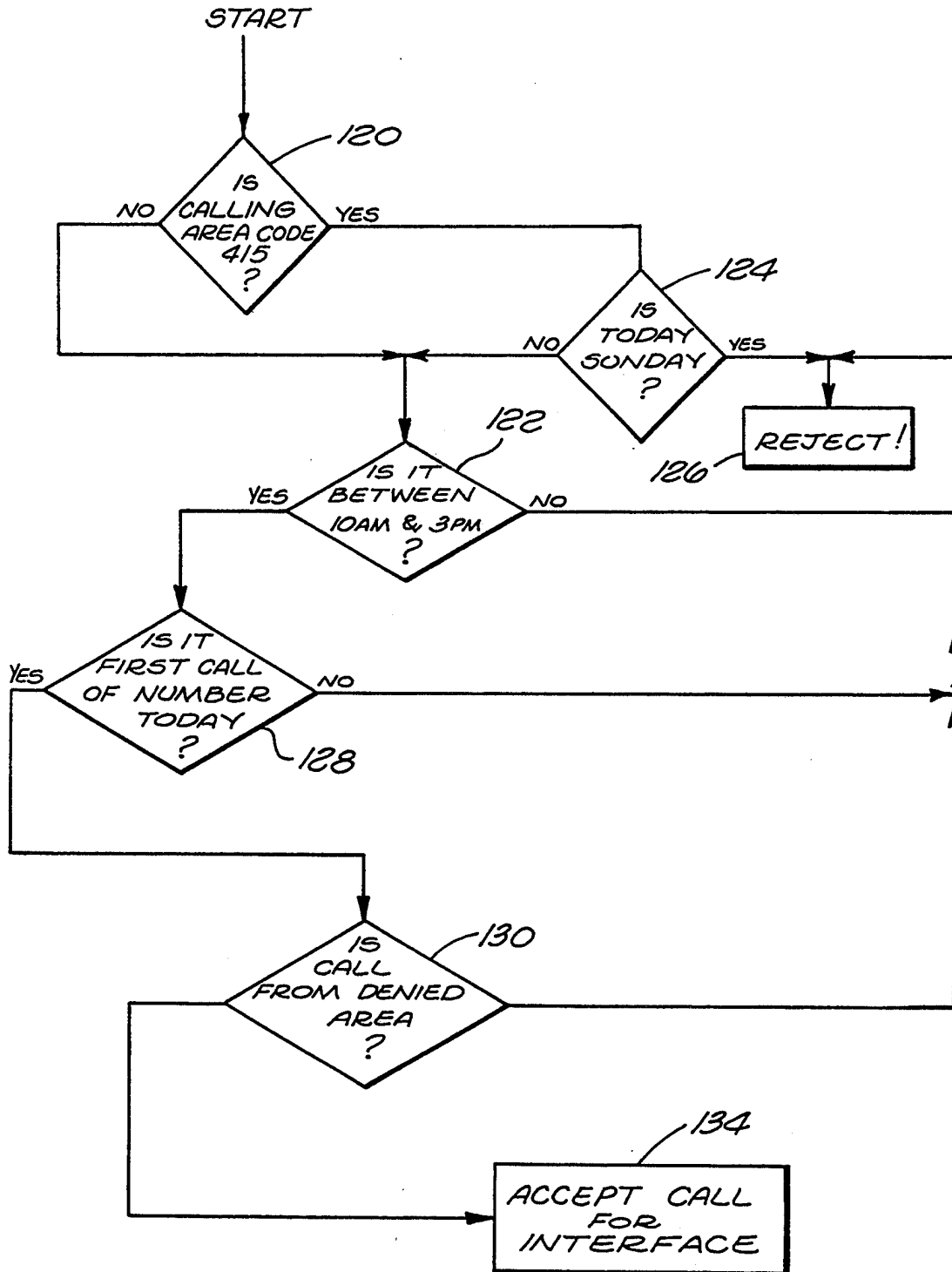


FIG. 6

5,351,285

1

MULTIPLE FORMAT TELEPHONIC INTERFACE CONTROL SYSTEM

RELATED SUBJECT MATTER

This is a continuation of application Ser. No. 07/509,691 filed Apr. 16, 1990 and entitled "Telephone Interface Control System", now abandoned, which is a continuation-in-part of application Ser. No. 260,104 filed Oct. 20, 1988 and entitled "Telephonic Interface Control System", now U.S. Pat. No. 4,930,150 which is a continuation-in-part of application Ser. No. 018,244 filed Feb. 24, 1987 and entitled "Statistical Analysis System For Use With Public Communication Facility", now U.S. Pat. No. 4,792,968, which was a continuation-in-part of application Ser. No. 753,299 filed Jul. 10, 1985 and entitled "Statistical Analysis System For Use With Public Communication Facility", now abandoned. Also, this application is a continuation-in-part of application Ser. No. 07/640,337 filed Jan. 11, 1991, and entitled "Telephonic-Interface Statistical Analysis System", which is a continuation of application Ser. No. 07/335,923 filed Apr. 10, 1989, and entitled "Telephonic-Interface Statistical Analysis System", which is a continuation of application Ser. No. 07/194,258 filed May 16, 1988, and entitled "Telephonic-Interface Statistical Analysis System", now U.S. Pat. No. 4,845,739, which is a continuation-in-part of application Ser. No. 018,244 filed Feb. 24, 1987 and entitled "Statistical Analysis System For Use With Public Communication Facility", now U.S. Pat. No. 4,792,968, which is a continuation-in-part of application Ser. No. 753,299 filed Jul. 10, 1985, and entitled "Statistical Analysis System For Use With Public Communication Facility", now abandoned. The benefit of the earlier filing dates in the United States is claimed under 35 U.S.C. §120.

BACKGROUND AND SUMMARY OF THE INVENTION

Over the past several years, substantial expansion has occurred in the technology of combining telephonic and computer systems. For example, telephone systems have been developed to readily transmit digital data. Various forms of modems are in widespread use to intercouple telephones and computers. However, at a more personal level, it also has been proposed to utilize the traditional dialing buttons of telephone instruments to provide digital data, as for various processing. In accordance with such arrangements, voice messages prompt callers to provide data by actuating the alphanumeric buttons of conventional telephones. These systems have been proposed in association with computers to provide various services and one such system is disclosed in U.S. Pat. No. 4,792,968, issued Dec. 20, 1988, to Ronald A. Katz from an application Ser. No. 018,244 filed Feb. 24, 1987.

With respect to telephonic-computer systems, attaining the interface format desired by an individual caller is sometimes complex and burdensome. Specifically, callers may be misdirected, screening may be ineffective and delays may be cumbersome. Also, records may be poor or non-existent. Furthermore, some situations exist where interface to a live operator is an important alternative. As a consequence, a need exists for an improved interface system for selectively interfacing a considerable number of individual callers with a multiple format processor, as to attain efficient and economical digital

2

and vocal exchanges along with prompting and data accumulation.

In general, the present invention comprises a telephonic-computer interface system accommodating digital and vocal (analog) telephonic communication and capable of handling a large number of calls to selectively interface prompted live-operator stations or formats in a computer processor. The selected interface is controlled, as by call (called number, calling number, etc.) and can be altered under control of an operator, developed data or operating conditions. Accordingly, the system of the present invention interfaces: (1) a telephonic communication facility including remote terminals for individual callers, e.g. conventional telephone instruments including voice communication means, and digital input means in the form of alphanumeric buttons for providing data and (2) either a prompted live-operator station or a multiple port, multiple format data processor for concurrently processing data from a substantial number of callers with respect to any of several formats.

The interface system incorporates a controller for receiving calls from remote terminals for association with ports in the telephonic computer apparatus, and which receives signal-represented call data (representing "calling" and "called" telephone numbers) along with equipment information. An index apparatus is controlled, as by the signal-represented call data, to select initially a live-operator or machine format of the processor so as to specify any conditions for the interface, at least one of the formats including at least one condition. A test apparatus may determine whether or not an individual call attains specified conditions and thereby controls switching structure for providing the actual interface. If a live-operator terminal is selected, or indicated as a secondary format, prompt data is provided to a select station. Data is recorded and processing procedures also may be controlled by call data.

BRIEF DESCRIPTION OF THE DRAWINGS

In the drawings, which constitute a part of this specification, an exemplary embodiment exhibiting various objectives and features hereof is set forth, specifically:

FIG. 1 is a block diagram of a system constructed in accordance with the present invention;

FIG. 2 is a flow diagram illustrating the operating process of the system of FIG. 1;

FIG. 3 is a block diagram of a component portion of the system of FIG. 1;

FIG. 4 is a diagrammatic representation of a binary control word as registered and utilized in the system of FIG. 1;

FIG. 5 is a diagrammatic representation of a binary data record word as utilized and recorded in the system of FIG. 1; and

FIG. 6 is a flow diagram illustrating the operating process of the structure represented in FIG. 5.

DESCRIPTION OF THE ILLUSTRATIVE EMBODIMENT

As required, a detailed illustrative embodiment of the present invention is disclosed herein. However, physical communication systems, data formats, and operating structures in accordance with the present invention may be embodied in a wide variety of forms, some of which may be quite different from those of the disclosed embodiment. Consequently, the specific structural and functional details disclosed herein are merely represen-

3

5,351,285

4

tative; yet in that regard, they are deemed to afford the best embodiment for purposes of disclosure and to provide a basis for the claims herein which define the scope of the present invention.

Referring initially to FIG. 1, a series of remote terminals T1-Tn (telephone instruments) are represented (left). The terminals T1-Tn are generally similar and accordingly only the terminal T1 is shown in any detail. The indicated terminals T1-Tn represent the multitude of telephone terminals existing in association with a communication facility CO which may comprise a comprehensive public telephone network.

The communication facility CO, along with the individual terminals T1-Tn, is coupled to a central processing station CS generally indicated by a dashed-line block. Generally with regard to the station CS, individual terminals T1-Tn are interfaced either with a processor P (upper right) or one of several live-operator stations OS1-OSn (lower left) through a call receiver unit CU and a switch SW. Essentially, the processor P and the switch SW cooperate (line 9) to control interfaces, with the processor P providing interface formats either (or both) to automate an interface or prompt a live operator at a station OS1-OSn. Note that the interface formats are stored as described below in the processor P.

In accordance herewith, individual telephone calls are preliminarily processed on the basis of signal-represented call data to identify a specific operating format for a station or the processor P. The preliminary processing may invoke screening tests to impose conditions or establish a test criteria for the switch SW to determine the acceptability of the call to interface with a specific operating format.

Calls are selectively processed according to a specific operating format as indicated by call data. At any instant of time, the collective interface may involve several thousand calls simultaneously being processed through ports of the processor P. Exemplary selected formats of the processor might include: public polls, lotteries, auctions, promotions, sales operations and games. Accordingly, the stations OS1-OSn may comprise a substantial number and the processor P may take the form of a sizable computer capable of simultaneously processing many calls involving several different formats. Although numerous possible configurations are available, for purposes of explanation, the processor P is illustrated simply as a block with multiple ports. Note that while the switch SW and the processor P may be integrated in a single system, they are separately illustrated to isolate the detailed structure and process of the present invention.

Input lines LI1 through LI_n from the call receiver unit CU enter the switch SW to provide calling data and communication paths. Output lines LO1 through LO_n function between the switch SW and the processor P as lines LS1-LS_n operate to serve the stations OS1-OSn. Note that various multiplexing techniques are well known in the telephonic art to communicate call data and may be employed in the system.

Considering the system somewhat summarily, individual calls originating at the terminals T1-Tn are coupled through the communication facility CO and the call receiver unit CU to the switch SW. Call data, representative of calls, actuates the switch SW to preliminarily process each call based on the desired format. For example, depending on the desired format (indicated by the called number and/or the equipment data signals)

calls are selectively coupled and processed. Furthermore, record data is assembled for storage.

Considering the system of FIG. 1 in somewhat greater detail, the exemplary telephone terminal T1 includes a handpiece 10 (microphone and earphone) and a panel 12 provided with a rectangular array of push buttons 14 in a conventional configuration. Of course, the handpiece 10 accommodates analog signals while the panel 12 is a digital apparatus. Generally, the handpiece 10 serves to manifest analog or voice signals to a caller.

In accordance with conventional telephone structure, alphabetic and numeric designations are provided on the buttons 14. For example, several of the buttons 14 carry three letters along with a decimal digit. Specifically, the button designated with the numeral "2" also carries the letters "A", "B" and "C". Thus, the buttons 14 encompass the numerals "0-9" two symbols, and the alphabet except for the letters "Q" and "Z". Consequently, the buttons 14 substantially accommodate the entry of decimal and alphabetic data.

At this stage, some specific aspects of the communication facility CO are noteworthy. Essentially, with telephonic dialing, the communication facility CO couples selective terminals (from the multitude of terminals T1-Tn) to the call receiver unit CU. In that regard, the unit CU at the central station CS may be reached by any of a plurality of called numbers. For example, the call unit CU might be reached by any of twenty telephone dialing numbers, each associated with a specific operating format of the processor P. One called number or set of numbers might be associated with an auction format of the processor P. Another number or set of numbers might be associated with sales operating formats. Still another called number or set of numbers might identify a game format, and so on.

Incoming calls to the call receiver unit CU are identified by call data in accordance with telephone system techniques. As described below, the call data may specifically include digital signals representative of the called number (DNIS), the calling number (ANI) (terminal number), and the terminal equipment.

In addition to attaining a preliminary interface with a selected format, individual calls may be screened based on the called number (identifying an operating format) and the calling number (caller identification) or the equipment. That is, the system of the present invention is based on a realization that signal-represented call data can be effectively utilized to selectively interface individual callers at remote terminals with specific operating formats of a data processor.

Considering the call data in somewhat greater detail, in accordance with current telephone systems, the communication facility CO may provide signal-represented call data for: the "called" number, the "calling" number, and the equipment involved, e.g. "pulse" or "tone" terminal. Specifically, operating telephone equipment termed "DNIS" automatically provides the called telephone number in digital form from the communication facility CO. Somewhat similarly, existing telephonic equipment designated "ANI" automatically indicates the caller's (calling) number in digital signal represented form. Generally, time shared lines carry such call data and also may provide call data indicating equipment. Thus, the call unit CU may receive the called number, the calling number, and a calling equipment designation (pulse or tone), collectively termed call data, which data is utilized to establish control functions, as for

5,351,285

5

example to select an operating format for a station OS-1-OSn or the processor P.

As described in detail below, call data is registered in the switch SW to perform distinct control operations. Specifically, a selection section 16 of the switch SW identifies a specific desired format for the stations OS-1-OSn or the processor P. Depending on the format, a testing section 18 of the switch SW may screen calls for interface connections.

Recognizing that the possibilities are great, formats for calls in accordance with the disclosed embodiment may be of three different classes. Specifically, call formats may specify any of the following operations:

1. couple to live operator station if possible or in accordance with a predetermined criteria; if no operator station available, couple to processor;
2. interface to processor;
3. either above format, but selectively re-couple to live operator station or processor depending on secondary conditions.

The ramifications of individual formats within the above classes may vary considerably; however, some examples will illustrate possibilities. A marketing format (class 1) might interface callers to a live operator if an operator is available. Upon receiving a call, the operator station OS1-OSn (FIG. 1) also receives and displays prompting format data for the attending operator. If an operator is not available (all stations OS1-OSn busy) the system provides an interface with the processor P and a format as to record the data for a return call by an operator. Alternatively, the processor completes the transaction with data provided by the caller that may be digital, digital and voice, or voice.

In a game format, say of class 2, a caller may be limited to interface the processor P. The interface may be contingent on initial test conditions, e.g. call data, caller record, time, etc.

Formats of class 3 involve a switch between live operator and processor depending on secondary conditions. For example, a polling format may switch from the processor P to an operator station OS1-OSn if the caller fails to provide digital data in a responsive form. Alternatively, an operator may command a switch to the processor P upon identifying a specific caller from whom data is to be taken.

In the illustrative system of FIG. 1, an operating process is executed as illustrated in FIG. 2. Each incoming call prompts a preliminary query as indicated by a block 20 concerning the availability of a line or port. In the absence of an available line, a busy signal is provided as indicated by the block 22. Alternatively, an available line results in a preliminary interconnect as indicated by a block 24 setting a conditional connection into operation.

As indicated by a block 26, during the screening or testing interval (typically measured in seconds or fractions of seconds) the caller remains on line and may receive a message. That is, the caller might hear silence or may continue to hear the traditional telephonic ringing sound. Alternatively, the caller might be given a brief vocal message to "stand by" as indicated by the block 26. In any event, the caller is held "on line" while the process continues.

With a call on a line, the communication facility CO (FIG. 1) provides signal-represented call data, e.g. the called number, the calling number, and the equipment designation. As indicated by block 28 (FIG. 2) signals representative of the call data are captured to perform

6

preliminary control and processing operations as will now be considered. Note that the selected formats will fall within one of the classes as stated above.

The initial test is illustrated by a query block 25 representing an operation to distinguish calls of class 1 (operator) and class 2 (processor). Calls for a format seeking an operator prompt a "yes" response from the block 25 and proceed to the test of a block 27, "is an operator available?". A "yes" determination advances the process to an operation indicated by a block 29. Specifically, the block 29 represents the operations of coupling a caller to an operator station and transferring the appropriate format data to the station for prompting the operator. If no operator is available (block 27) the process proceeds with automated control to attain an interface in accordance with an appropriate format. Specifically, a control word is fetched (block 36) to establish an operating format for interfacing the call. In that regard, the specified format may be very simple. For example, the call simply may be prompted to indicate identification for a return call. Alternatively, the format may incorporate conditions or other complications as explained below.

Returning to the query block 25, if the call is to be coupled to the processor, an initial test operation is indicated by a block 30. A validity test is performed, for example, a list of calling numbers may be compiled that are to be denied access to any interface with the processor P. Negative calling numbers may result either by the choice of the person responsible for the calling number terminal, or by the choice of the service operating the processor P (FIG. 1). For example, an accumulation of prior improper transactions from a terminal designated by a specific telephone number may provide a basis for complete disqualification. Equipment also may disqualify.

Recognizing that various circumstances may be involved with respect to the total disqualification of a calling terminal, in accordance herewith the test involves formulation of a validity bit as indicated by the query block 30. Acceptable calls set the validity bit at a binary "1".

If the calling terminal is invalid, ("no" from the block 30) the call is rejected as indicated by the block 32 with or without a message and the line is released as indicated by the block 34. Note that the time interval involved is very short and the rejection message may take various forms including a verbal comment, a busy signal or simply a disconnected signal.

If a positive validity bit ("1") is formed at the junction of the query block 30, a control word is fetched under command of the called number as indicated by the block 36. As described in detail below, a control word is available for each operating format of the processor P and is utilized to impose the conditions for an interface and the terms of any associated billing.

As indicated in FIG. 2, the fetched control word of the block 36 prompts an inquiry as to the conditions attendant the selected operating format as indicated by a query block 38. That is, in the process, the query of block 38 determines whether further conditions are imposed for attaining interface with the processor P. If no further conditions are imposed, the format is initiated by pursuing the connected interface as indicated by a block 40. Also, as indicated by a block 42, the call is logged or recorded as with respect to billing data for example.

5,351,285

7

If access to a format involves conditions ("yes" from the query block 38), tests are specified as illustrated by a block 44. That is, conditions for the interface are specified by the block 44. Of course, the specific tests may involve various criteria; however, in the illustrative embodiment, the conditions involve time, history and demographics. Each exemplary condition will now be considered somewhat preliminarily.

In the disclosed embodiment, time tests involve testing the time of the call against certain limitations. For example, it may be desirable to limit some formats to specific time intervals as in relation to a television broadcast, a real time auction and so on. Note that the time tests also may be related to specific terminal control and geographic areas treated on the basis of telephone area codes. Specific examples will illustrate.

Assume an operating game format that propounds questions to a caller based on knowledge of a particular television program. The program may be broadcast at different times in different geographic areas, and as a consequence it may be desirable to limit calls interfacing the processor format depending on the area code of calling numbers. Accordingly, time tests may involve solely the instant time, or various combinations of time and call data. The specific test is determined as indicated by a block 46 (FIG. 2) imposing detailed operating instructions for the format. The test results are then correlated as represented by a block 48.

As indicated above, in accordance with the described embodiment, another test involves a record as for example directed to the station identified by the calling number. As an example, the record might take the form of either a negative or a positive file (for an individual format). In that regard, all formats involving "pay to dial" (e.g. 976, 900 etc.) calls might be conditioned as a group. Generally, in the case of a negative file, certain numbers are recorded that are to be denied access to a particular operating format. In the case of a positive file, access to the operating format is available only to calling numbers listed in the file.

Considering exemplary implementations of the system, a negative file may be based on limited or restricted use (as in the case of a lottery) or prohibitive use (telephone terminal owner choice). Formats accessible on a "one-time only" basis also may be controlled by negative lists. Thus, an operating format may be inaccessible to a terminal, or may be accessible a specified number of times during a specified interval, e.g. three accesses per week. The historical test is symbolized in FIG. 2 by the query block 50 to conditionally actuate the related tests as indicated in the block 48. History limitations also may involve purely format limits. For example, a give-away or dial-free format may be limited to some predetermined number of calls for a period, e.g. ten thousand calls per day. Thus, limits can be imposed on the economic exposure of a format.

Moving from the historic considerations, demographic tests may be specified as in relation to the geographic area manifest by the area code of the calling number. To consider a specific example, a public opinion poll may be conducted in which a particular geographic balance is defined. In such an operating format, calls may be accepted only until particular quotas are attained with respect to specified area codes. Such tests in the process are indicated by the query block 52, again to instruct the correlation block 48.

With the requisite tests established by selection of a format, the block 48 indicates resolving the acceptabil-

8

ity of the call for the selected interface format. If the call is accepted, the process moves to initiate the selected format interface as indicated by the block 40. Conversely, if the call is to be rejected, the process moves to the step indicated by block 32, i.e. reject the call as with a message and release the line.

If a call is accepted, as represented by the block 40, there is a possibility that an established format may be aborted in favor of a different format. For example, interfacing the processor P, a qualified caller may fail to communicate digitally with the result that transfer to a live operator is commanded. Also, in certain situations, a connection to a live operator is to be terminated in favor of an interface to the processor. In either event, an existing format is terminated in favor of a fresh format. That phase of the process is illustrated by an "abort" line from the block 40 returning to the block 28. Thus, the process returns to re-assign the caller to a new format in accordance with fresh data. Thus, transfers according to class 3 operation are implemented along with the other classes of operation by the switch SW (FIG. 1).

An exemplary detailed structure of the switch SW (FIG. 1) for executing the process of FIG. 2 is represented in FIG. 3. In that regard, individual telephone calls are manifest from the call receiver unit CU (FIG. 1) comprising existing equipment as well known in the prior art. The call data is supplied through a line 60, upper left, FIG. 3. Note that the represented single line 60 is merely symbolic of a channel to carry call data and provide direct telephone communication.

Generally, the system of FIG. 3 illustrates elements of the switch SW of FIG. 1 for processing an individual call. As indicated above, the system of the present invention involves the simultaneous processing of many calls with the possibility that numerous calls are simultaneously being tested for a connection as explained above. Consequently, although the system of FIG. 3 is illustrated with respect to testing a single call, it is to be understood that sequential or parallel operations and multiplexing techniques, as well known and widely practiced in the computer field, are utilized to accomplish multiple processing operations as are described below with reference to FIG. 3.

The line 60 (FIG. 3, upper left) enters a line capture unit 62 through which signal-represented call data is supplied to a call data register 64. Accordingly, the call data is registered to be available for processing operations as explained generally with reference to FIG. 2.

The line capture unit 62 also is connected to a control unit 66. Structurally, the control unit 66 may take the form of various computer facilities incorporating memory and logic capability to sequence and control specific functions as explained below. Generally, the control unit 66 implements specific formats which may involve coupling a caller either to a live operator station OS1-OSn or to the processor P. In that regard, the control unit 66 provides a series of timing signals t1-t6 to sequence the operations of individual component blocks as illustrated. Note that to preserve clarity in FIG. 1, connections of timing signals t1-t6 are not illustrated. Also, the control unit 66 is connected to the operator stations OS1-OSn (line 67) to receive signals indicative of the availability of stations.

In addition to logic for controlled switching as described, the control unit 66 specifically includes a call register 68, a control register 70 and test control logic 72. The control register 70 receives format control

9

words specified, as by the called number and having a form as illustrated in FIG. 4.

Recapitulating, each of the operating formats has a control word for defining any access conditions or limitations to accomplish a specific format, e.g. connection to an operator station OS1-OSn or to the processor P (FIG. 1). The formats may vary considerably; however, a few examples are the following:

Class 1, connect the live operator if available and provide prompt data for the XYX Company telemarketing program, if operator not available, cue caller: "All operators are busy at the moment, but we will return your call as soon as possible. Please touch your telephone buttons '2' and '4' to identify yourself as twenty-four for the return call".

Class 2, couple qualified callers to computer P for polling interface.

Class 3, couple callers to computer P for the RST Company telemarketing program, however, transfer to live operator (and prompt) if caller is not responsive.

These formats are established by control words that are selected on the basis of call data. The control words are sixteen bits, illustrated as the first sixteen bits (1-16) registered as shown in FIG. 4. An additional group of registered bits (17-20) are provided from call data.

The initial three registered bits in the control register (FIG. 4) serve as test command bits respectively for a time test, a history test and a demographics test. The presence of a "1" bit in any of the first three bit locations specifies the requirement for testing compliance to specified conditions. A "0" bit indicates no test.

The bits "4 through 7" in the control register constitute a field 74 and specify time conditions in relation to the instant time of the call. The field 74 may specify eight distinct time conditions. For example, exemplary specified conditions for a format might be as follows:

Accept calls between 7:00 and 18:00,

Accept calls on Thursday between 9:00 and 10:00,

Accept calls from area code 213 on Wednesday between 15:00 and 16:00,

Accept calls from area code 602 on Wednesday between 16:00 and 17:00.

Essentially, the time condition field 74 (activated by the time bit "1" - first bit position) defines specific intervals during which calls will be accepted for the specific called number and may be further limited by the area codes. A wide range of possibilities are available to accommodate specific programs for individual formats.

A field 76 in the control register embraces bits "8" and "9" and defines the conditions for access to the format based on historical considerations. Thus, two bits are provided to indicate four possible historical limitations. Again, the test is specified by a "1" bit, in this instance in the second bit location of the register 70. The following limitations are exemplary of many possibilities as related to a single telephone number:

Accept one call per day (per caller),

Accept one call per week (per caller),

Accept one call per month (per caller),

Accept one call during any three-day period (per caller),

Accept only 10,000 calls (per format).

Continuing with respect to the contents of the register 70, as illustrated in FIG. 4, bits "10" and "11" constitute a field 78 specifying demographic test limitations. Again, a few examples will illustrate the various possibilities:

5,351,285

10

Accept calls only from area code 213,

Accept calls from area codes 213, 818 and 619,

Accept only 1,000 calls from area code 213,

Accept calls from area code 213 with the prefix numerals 619.

Again, the demographic test is imposed only upon the existence of a "1" bit, in this instance in the third bit of the control word. As in the other cases, specific possibilities are considerable.

The bits "12" through "16" of the control word constitute a field 80 and designate a selection code for the identified format. These five bits enable a substantial number of formats to be designated and coded with respect to various classifications. For example, calls of the class 1 specifying a desirable connection to a live operator station OS1-OSn might be encoded in a "000" decimal series, e.g. "001" indicates XYZ Company telemarketing program, "034" indicates RST Company program, and so on. Accordingly, a "0" in the most significant digit specifies a live operator format. Similarly, lottery formats might be encoded in a "100" decimal series, e.g. "101, 102, 103 ... 110, 111, 112" ... and so on; auctions might be designated in a "200" series, e.g.: "201, 202, ...". By using decimal equivalent coding formats for various categories, exclusions may be concisely stated. For example, a calling number may be excluded from all lottery operating formats simply by the specification of decimal "100" in association with the calling number.

The data, as illustrated in FIG. 4 is loaded into the control register 70. Again, the first sixteen bits comprise the format control word and are provided from a look-up table 84 (FIG. 3, right, central) upon being addressed by call data from the register 64.

The last bits (bits 17-20) stored in the control register 70 are provided from an equipment and billing instruction index 86. That is, in response to the signal-represented call data indicating the called number and the equipment, the look-up table 84 and the index 86 supply data for loading the control register as indicated above.

While the control register 70 is loaded to specify the operation of the system, the call register 68 in the control unit 66 receives signals for additional control and to formulate a record of the call. Specifically, as represented in FIG. 5, the contents of the call register 68 includes an initial validity bit 88 for indicating that the called number is either on a positive list or is not on a negative list. The determination of the validity bit for location 88 is made by reference to a memory 90 (FIG. 3, central) addressed by the calling number.

While the calling number addresses data to indicate a validity bit, specific format exclusions also may be indicated as explained above with respect to certain formats. For example, certain classifications of formats or specific formats (as a lottery) may be identified as inaccessible for certain telephone terminals as identified by calling numbers. Other than lottery formats, certain discretionary formats also may initiate control to limit access. Accordingly, a field 89 in the call register 68 (FIG. 5, bits "2" through "6") is provided from the memory 90, addressed by the calling number to specify format exclusions. That is, the calling number addresses the memory 90 to load the field 89 and specify limitations. Consider a few examples of format exclusions or limitations for a calling number:

No lottery formats,

One lottery format per week,

5,351,285

11

Two lottery formats per month of total cost under \$25.00,

No auction sales,

Auction sales only with caller entered code I.D. 763.

Again, it will be apparent that many possibilities exist in applying various coding techniques, the above merely being exemplary. Also, as indicated above, a format may be void of any limitations or restrictions. In that event, as explained above, a connection or interface is promptly commanded by the format code.

The bits "7" through "26" stored in the call register 68 (FIG. 5) constitute a field 91 and indicate the time of a call. Signals representative of the instant time of a call to load the field 90 are provided from a time clock 92 (FIG. 3, upper left). Signals from the time clock 92 may be in a Julian code and are provided to the call register 68 and also to a time test logic network 94 (lower left).

The last bits (27-30) in the register 68 are provided from the call data. The bits "27" and "28" indicate format billing data and comprise a field 82. Again, representations are coded; however, with respect to the field 82 information is derived from the called number. For example, an "800" called number may indicate no billing with the representative code being stored in the field 82. As another possibility, a "976" prefix number, or "900" number, may indicate a specific charge in relation to the identified format.

The bits "29" and "30" comprise a field 83 and may actuate a special form of the selected format. In the disclosed embodiment, the field 83 registers call data, as to indicate that the calling terminal is a "pulse" (rotary dial) signal unit or a "tone" (touch) signal unit. In the instance of a rotary terminal, the format program may be modified to accommodate "pulse" signal operation or inject operator communication with a transfer to one of the stations OS1-OSn.

Recapitulating to some extent with regard to the composition of the call record word in the register 68 (FIG. 5), the memory 90 (FIG. 3) is addressed by calling number data to provide data for the validity bit location 88 and the format-exclusion field 89. The time of call is stored in the field 91 from the clock 92. The billing and equipment data are provided by the index 86 in response to "calling" data signals.

Another element of memory, specifically, a recent activity storage 98 (FIG. 3, lower right) is separately illustrated for convenience of explanation. Essentially, the storage 98 receives words from the call register 63 to maintain a record of interface calls. The recent activity storage may periodically be purged to permanent storage if desired. Thus, the recent activity storage 98 accumulates an activity record of all interface participants with respect to specific formats and is utilized in the history test for determining that an instant calling terminal is within the specified historical limitations as provided from the memory 90.

The activity tests are performed by a history test logic network 100 (FIG. 3, lower central). In a related context, the demographics test as explained in detail above is performed by a demographics test logic network 102. The results of the test logic networks are communicated to the test logic 72 in the control unit 66. As a consequence, a switch unit 105 is actuated to either operatively couple the line 60 into a port of the processor P (FIG. 1) or reject the call. If a call is accepted for an interface, a signal is supplied from the test control logic 72 through a line 107 to the switch 105 during the interval of the timing signal T6. The signal in the line

12

107 also is supplied to a format address register 109 for addressing the processor P. The register 109 stores select data signals to address a specific operating format of the processor P.

Recapitulating to some extent, call data indicates an interface format of the processor P (FIG. 1) with associated limitations, conditions and billing provisions. Call data also indicates possible format limitations or conditions for a calling number. The system processes the data with respect to the conditions and limitations to selectively enable interface operations. Essentially, the call data specifies a format (processor or operator) and any conditions relating to the format. Representative data accordingly is provided from the look-up table 84 and the memory 90 to the control register 70 and the call register 68 respectfully. Preliminary conditions may or may not be involved; however, qualified calls for an operator involve tests of availability within the control unit 66 according to data received from the stations OS1-OSn (line 67). As a result, calls are either interfaced to an operator who receives a format prompt, or interfaced to the processor according to a specified format. Thereafter, a shift may command a redetermination and a transfer as described in detail below.

In view of the above structural and logic description of the system of FIG. 3, the process as described with respect to FIG. 2 and the stored control word forms as described with respect to FIGS. 4 and 5, a comprehensive understanding of the described embodiment may now best be accomplished by assuming an exemplary call and treating the individual responsive steps. Accordingly, assume the occurrence of a call as manifest on the line 60 (FIG. 3, upper left). Further, assume that the called number, "976 513 7777" designates a lottery format with limited access. Details of the limited access will be treated below.

Upon occurrence of the call, the line capture unit 62 seizes a line relationship and signals the control unit 66. Immediately, an interval of time signal t1 is initiated and the register 64 is loaded with the called number ("900 513 7777"), the calling number ("415 318 4444") and the equipment designation (tone or no tone). To the caller, the operations as now described involve an almost imperceptible delay.

During the following interval of timing signal t2, the call register 68 and the control register 70 are loaded as illustrated respectively in FIGS. 4 and 5. Specifically, the called number and equipment designation specify data to load the control register 70. The calling number ("415 318 4444") from the register 64, prompts the memory 90 to load the validity bit 88 and the format exclusions in the field 89 of the register 68. Concurrently, the time clock 92 loads the field 91 with signals representative of the current time.

If the call register 68 does not receive a validity "1" bit, the calling number is indicated to be barred with a consequence that the line is released by the control unit 66. In that regard, a voice generator 106 (FIG. 3, left central) may be actuated by the control unit 66 branching to the operation of timing signal t6. Accordingly, a message of denial may be provided on the line 60 prior to release of the line. Note that the voice generator 106 may be variously used to prompt or inform callers in certain preliminary selection operations supplemental to the specific operations disclosed below.

As indicated above, concurrently with the loading of the call register 68 (timing signal t2), the control register 70 also is loaded. Specifically, from the register 64, the

5,351,285

13

called number cues the look-up table 84 to fill most of the control register (bits "1" through "16" FIG. 4) The fields 82 and 83 are supplied from the index 86.

That is, distinct from the fields loaded into the control register 70 from the look-up table 84, the fields 82 and 83 are supplied from the index 86. In that regard, assume the called number (area code 976) indicates that the charge for the service of the call will be billed through the caller's telephone records. Assume that the field 83 indicates a "tone" terminal effective for a conventional digital interface.

At this point, some still further assumptions will be made to pursue the explanation of the detailed operations. Specifically, assume that the format specified by the called number ("900 513 7777") is a lottery format and includes limitations with respect to time, history and demographics. Accordingly, the initial three bits of the control word all will be "1" bits in the control register 70.

Assume further that the time conditions specified by the field 74 (FIG. 4) limit calls from area code 415 to days other than Sunday. Assume that the history field 76 of the control word imposes a limitation of one call per day per calling station. Assume that the demographics field 78 excludes any call from area codes "512", "412", "812", . . . (not "415"). Finally, assume the selected format (field 80) designates a specific lottery format, that is lottery "128".

In addition to registration of the data sets detailed above, because a history test is specified, the recent history storage 98 is cued during the interval of timing signal t3. The operation is through the memory 90 by the control unit 66 to prompt the supply of historical data (previously registered record words) for the telephone terminal designated by the calling number ("415 318 4444"). Specifically, during the interval of timing signal t3, the storage 98 supplies data on the calling number to the history test logic network 100. Such data is compiled into a test format as to indicate the number of calls per day, per week, and so on. Note that aggregate call totals may also be supplied as a test criteria. Thus, the control unit 66 coordinates the test criteria data preparatory to the test operations of the individual logic networks 94, 100 and 102.

To summarize, in accordance with the above assumptions, the test control logic 72 is set up to coordinate the following specific logic tests:

Time limitation test by network 94: accept calls from area code 415 except on Sunday,

History limit test by network 100: accept only one call per day per station,

Demographics test by network 102: accept no calls from area codes 512, 412, 812 . . . (415 not listed).

As explained above, in addition to the limitations specified, in relation to the format, further limitations may be specified by the calling number. Such limitations are specified by the field 89 in the register 68 (FIGS. 3 and 5). In the instant example, assume that according to the record word, participation in the lottery format is limited to the interval between 10:00 a.m. and 3:00 p.m., e.g. when minors are in school. The code for such a format is supplied during the interval of timing signal t3 from the field 89 of the call register 68 to further establish the set-up of the logic 94 acting through the test control logic 72.

Recapitulating with regard to the test control logic 72, essentially a program is defined imposing each of the limitations that are specified by the call data in sufficient

14

detail that comparison tests are expediently performed by the networks 94, 100 and 102. It is stressed, as indicated above, that the tests are selectively performed only in the event a "1" bit appears in the representative first three bit locations of the control word format. In the illustrative example, all the tests were commanded and accordingly the test control logic 72 sets up the condition for tests to be performed by the networks 94, 100 and 102, all during the interval of timing signal t3. Of course, the specific example represents one possibility of a substantial number of programs that might be specified to the system.

With the test formats established in the test control logic 72, the logic networks 94, 100 and 102 are driven during the interval of test signal t4 to execute a program in accordance with the assumed example. The process may be variously implemented in logic using well known techniques and is detailed in FIG. 6. Consider the time test of the network 94. The time test logic network 94 approves an interface only if: the call is not from area code "415" on a Sunday and furthermore the call occurs between the hours of 10:00 a.m. and 3:00 p.m. As indicated in FIG. 6, a decision block 120 resolves the area-code "415" time test. If the area code is not "415", the logic proceeds to the next query block 122. Alternatively, if the area code is "415" the day must be tested against Sunday as indicated by the query block 124. An affirmative indication from the Sunday test of block 124 prompts a rejection as indicated by the block 126.

If the Sunday test of block 124 is passed, the program imposes another time test, that is the time-of-day test as indicated by the block 122. Again, a negative result prompts a rejection; however, a positive result involves the next step as indicated by the block 128.

Note that the operations designated by query blocks 120, 122 and 124 are performed by the time test logic network 94 (FIG. 3). The next test of the block 128 is performed by the history test logic network 100. The block 128 (FIG. 6) involves a determination of whether or not the instant call is the first for the calling terminal on the instant calendar day. If not, the limitations are exceeded and the call is rejected. If the test is passed, the process next involves the demographic test logic network 102 (FIG. 3) to determine whether or not the call originated from an excluded area based on the calling number area code.

Area controls are illustrated by the query block 130 of FIG. 6. Specifically, the demographics test logic network 102 determines whether or not the current call is from a denied area. If so, the call is rejected as indicated by the block 126. Alternatively, if the area is not excluded, as illustrated by the block 134 in FIG. 6, the interface is accepted. In the instant case, the area "415" is acceptable.

In the operation of the system as illustrated in FIG. 3, the logic networks 94, 100 and 102 indicate test results to the test control logic 72 during the interval of the timing signal t5. The logic 72 correlates the test result for action by the control unit 66. If the imposed conditions are met (or if there are no conditions) the control unit 66 actuates the switch unit 105 and the address register 109 through the line 107 to perfect the interface from the line 60 (upper left) to either a port in the processor P (FIG. 1) or one of the operator stations OS-1-OSn. Essentially, the switching operation occurs during the interval of the timing signal t6. Concurrently, the address register 109 specifies the select oper-

5,351,285

15

ating format as stored in the processor P for direct use in an interface with a caller, or to be retrieved and supplied through the switch SW to prompt an operator at a station OS1-OSn.

Also during the interval of the timing signal t6, the contents of the call register 68 is stored in the recent history storage 98. Note that billing data is stored with the call words and may be selectively extracted from the storage 98. At the termination of the timing signal t6, the interface endures until there is a "disconnect" or an "abort".

If the processor P senses the existence of conditions specifying a shift between a processor interface and a live operator communication, the control unit 66 is actuated as indicated through line 115. Note that the abort signal is formed either in response to predetermined conditions in an interface with the processor P, or on command from an active operator station. The signal is also supplied to the look-up table 84 which becomes active if a transfer is conditional. That is, if a transfer is conditional, the tests as described above may be invoked. Conversely, if the transfer is unconditional, the control unit 66 simply actuates the switch 105 to make the change and prompts the format address register to establish the desired format or prompt pattern for an operator.

The formats may involve various records, however, in accordance with the system of the present invention affords considerable flexibility to program individual conditions and limitations for each interface format based on the call data (calling number and called number). An interface may involve no conditions or conditions may be imposed from the called number (format selection), the calling number, or both. Accordingly, effective control may be imposed depending upon the service requested as manifest by an individual format, the instant time, the history of use and the demographics involved. The imposed limitations may be non-existent or may involve a relatively complex test pattern as explained in detail above.

In the disclosed embodiment, an effective record of calls is accumulated in the recent history storage 98. Thus, a composite and detailed record is accumulated of individual calls as executed.

It is to be appreciated that numerous formats may be implemented and controlled utilizing the principles of the system as illustrated above. Accordingly, it is to be understood that the system of the present invention should be interpreted in accordance with the claims as set forth below.

What is claimed is:

1. An interface control system for use with, (1) a communication facility including remote terminals for individual callers, wherein said remote terminals may comprise a conventional telephone instrument including voice communication means and digital input means for providing data, (2) a multiple port, multiple format processor for interfacing a substantial number of callers in any of a plurality of formats to concurrently process data, and (3) a plurality of live operator stations with prompting capability for a plurality of formats, said interface control system comprising:

call data means for receiving signal-represented call data from said terminals including DNIS automatically provided by said telephonic communication system;

selection means coupled to said call data means for selecting one of said formats under control of said

16

call data including DNIS to thereby further specify imposed conditions that must exist for a connection of a call either to said multiple port, multiple format processor or one of said live operator stations in accordance with said select one of said formats, at least one of said formats having at least one imposed condition; and

interconnect switch means for providing format data and controlling connections from a calling remote terminal to a port of said multiple port, multiple format processor or one of said live operator stations under control of said selection means.

2. A system according to claim 1 further including test means to specify test conditions for certain of said formats and means to test compliance with said conditions to further control said interconnect switch means.

3. A system according to claim 2 wherein one of said test means comprises means for executing a test based on the time of a call.

4. A system according to claim 2 wherein one of said test means comprises means for executing a test based on the history of the calling remote terminal.

5. A system according to claim 2 wherein one of said test means comprises means for executing a test based on the demographics of the calling remote terminal.

6. A system according to claim 1 wherein said selection means includes a look-up table for specifying said formats addressed by call data.

7. A system according to claim 1 wherein said selection means includes a control storage location and means for setting control data in said control storage location responsive to said call data.

8. A system according to claim 1 further including a voice generator means for prompting a caller.

9. A system according to claim 1 further including means for storing data representative of calls.

10. A system according to claim 9 wherein said means for storing includes means for storing billing data.

11. A system according to claim 1 further including means to provide an abort signal, the system being responsive to said abort signal to reactuate said interconnect switch means for providing alternative connections with format data.

12. A system according to claim 11 further including test means to specify test conditions for certain of said formats and means to test compliance with said conditions to further control said interconnect switch means.

13. A system according to claim 1 wherein said selection means selects under control of DNIS signals.

14. A system according to claim 1 wherein said selection means selects under control of ANI signals.

15. A system according to claim 1 wherein said selection means selects under control of equipment type signals.

16. An interface control system for use with, (1) a communication facility including remote terminals for individual callers, wherein said remote terminals may comprise a conventional telephone instrument including voice communication means and digital input means for providing data, (2) a multiple port, multiple format processor for interfacing a substantial number of callers in any of a plurality of formats to concurrently process data, and (3) a plurality of live operator stations with prompting capability for a plurality of formats, said interface control system comprising:

call data logic for receiving signal-represented call data from said terminals including DNIS automati-

5,351,285

17

cally provided by said telephonic communication system;
 selection logic coupled to said call data logic for selecting one of said formats under control of said call data including DNIS to thereby further specify 5 imposed conditions that must exist for a connection of a call either to said multiple port, multiple format processor or one of said live operator stations in accordance with a select one of said formats at least one of said formats having at least one imposed condition; 10
 test logic coupled to said selection logic for testing the imposed conditions to provide approval signals; and
 interconnect switch means for providing connections 15 from a calling remote terminal to a port of said multiple port, multiple format processor or one of said live operator stations under control of said selection logic and under control of said approval signals from said test logic.

17. A process for interfacing (1) a telephonic communication system including remote terminals either with (2) a multiple port, multiple format data processing system, said multiple port, multiple format data processing system for concurrently processing data from said 25 remote terminals according to a plurality of formats, at least one of said formats having at least one condition for a calling terminal, or (3) one of a plurality of operator stations with prompting capability for a plurality of formats, and wherein said telephonic communication 30 system provides call data signals, as to indicate called and calling numbers, said process including the steps of:
 receiving said call data signals from said telephonic communication system for a calling remote terminal indicative of DNIS and ANI automatically 35 provided by said telephonic communication system;
 selecting a processing format either for said multiple port, multiple format processing system or one of said plurality of operator stations for the calling 40 remote terminal under control of said data signals as the selected format;
 testing the selected format in relation to said call data signals; and
 conditionally interfacing said calling terminal to said 45 multiple port, multiple format data processing system for execution of said selected format or to one of said plurality of operator stations under control of said testing of call data signals.

18. A process for interfacing (1) a telephonic communication system including remote terminals either with (2) a multiple port, multiple format data processing system, said multiple port, multiple format data processing system for concurrently processing data from said 50 remote terminals according to a plurality of formats, at least one of said formats having at least one condition for a calling terminal, or (3) one of a plurality of operator stations with prompting capability for a plurality of formats, and wherein said telephonic communication 60 system provides call data signals, as to indicate called and calling numbers, said process including the steps of:
 receiving said call data signals from said telephonic communication system for a calling remote terminal indicative of DNIS and ANI automatically 65 provided by said telephonic communication system, wherein said plurality of formats consist of at least one pay to dial format and one 800 toll free format;

18

selecting a processing format either for said multiple port, multiple format processing system or one of said plurality of operator stations for said calling remote terminal under control of said call data signals as the selected format;
 testing the selected format in relation to said call data signals; and
 conditionally interfacing said selected format to said calling remote terminal under control of said testing of said call data signals.

19. A method for interfacing (1) a telephonic communication system including individual remote calling terminals for individual callers with (2) a multiple port, multiple format data processing system, said multiple port, multiple format data processing system for concurrently processing data from said remote terminals according to a plurality of formats, at least one of said formats having at least one imposed condition for said remote terminals calling to interface said data processing system, and (3) a plurality of live operator attended terminals, and wherein said telephonic communication system includes the capability of providing call data signals, said method comprising the steps of:

receiving said call data signals from said telephonic communication system for said remote terminals calling to interface said data processing system including DNIS automatically provided by said telephonic communication system;
 selecting for said remote terminals, a select processing format from said plurality of formats of said multiple port, multiple format data processing system under control of said call data signals including DNIS provided by said telephonic communication system;
 testing said select processing format in relation to said call data signals;
 conditionally interfacing said select processing format to said remote terminals under control of said testing in relation to said call data signals; and
 selectively terminating certain select calls from said remote terminals in favor of said operator attended terminals.

20. A method for interfacing (1) a telephonic communication system including individual remote calling terminals for individual callers with (2) a multiple port, multiple format data processing system, said multiple port, multiple format data processing system for concurrently processing data from said remote terminals according to a plurality of formats, at least one of said formats having at least one specified condition for said remote terminals calling to interface said data processing system, and (3) a plurality of live operator attended terminals, and wherein said telephonic communication system includes the capability of providing call data signals, said method comprising the steps of:

receiving said call data signals from said telephonic communications system for said remote terminals calling to interface said data processing system including DNIS automatically provided by said telephonic communication system;
 selecting for said remote terminals, a select processing format from said plurality of formats of said multiple port, multiple format data processing system under control of said call data signals including DNIS provided by said telephonic communication system;
 testing said select processing format in relation to said call data signals;

19

5,351,285

conditionally interfacing said selected processing format to said remote terminals;
 selectively terminating certain select calls from said remote terminals in favor of said operator attended terminals; and
 transferring substantially all of said certain select calls from said operator attended terminals back to said multiple port, multiple format data processing system.

21. A method for interfacing a telephonic communication system according to claim 19, wherein said conditionally interfacing step further comprises the step of: interfacing said selected processing format to said remote terminals based upon data entered by operators at said live operator attended terminals.

22. A method for interfacing a telephonic communication system according to claim 19, further comprising the step of:
 providing signal-represented call data from said remote terminals including calling numbers as additional call data signals.

23. A method for interfacing a telephonic communication system according to claim 22, further comprising the step of:
 providing said additional call data signals automatically from said telephone communication system (e.g. ANI).

24. A method for interfacing a telephonic communication system according to claim 22, further comprising the steps of:
 storing a record of negative file data, said select processing format using said additional call data signals to access said record and obtain data to specify and test for negative file conditions; and
 terminating calls from said remote terminals if said calling number matches said data obtained from said negative file data.

25. A method for interfacing a telephonic communication system according to claim 22, further comprising the step of:
 storing a record of positive file data, said select processing format accessing said record based on said additional call data and obtaining data to specify and test for positive file conditions.

26. A method for interfacing a telephonic communication system according to claim 25, further comprising the step of:
 terminating calls from said remote terminals if said data to specify and test for positive file conditions is not located.

27. A method for interfacing a telephonic communication system according to claim 25, further comprising the step of:
 recording terms of caller billing associated with said select processing format.

28. A method for interfacing a telephonic communication system according to claim 19, wherein a plurality of called numbers are associated with said select processing format.

29. A method for interfacing a telephonic communication system according to claim 19, further comprising the step of:
 testing to limit access to said select processing format on a one-time only basis.

30. A method for interfacing (1) a telephonic communication system including remote terminals for individual callers to make individual calls with (2) a multiple port, multiple format data processing system, said multi-

20

ple port, multiple format data processing system for concurrently processing data from said remote terminals according to a plurality of formats, at least one of said formats having at least one condition for said remote terminals calling to interface said data processing system, and (3) a plurality of live operator attended terminals, and wherein said telephonic communication system provides call data signals, said method comprising the steps of:

receiving said call data signals from said telephonic communications system for said remote terminals indicative of DNIS automatically provided by said telephonic communication system;

selecting a select processing format from said plurality of formats of said multiple port, multiple format processing system under control of said call data signals;

testing said select processing format in relation to said call data signals to provide approval signals;

conditionally interfacing said select processing format to said remote terminals under control of said approval signals and said call data signals; and
 storing data relating to said individual calls, along with any pay to dial billing data responsive to said call data signals.

31. A method for interfacing a telephonic communication system according to claim 30, further comprising the step of:

providing signal-represented call data from said remote terminals including calling numbers as additional call data signals.

32. A method for interfacing a telephonic communication system according to claim 31, further comprising the step of:

providing said additional call data signals automatically from said telephonic communication system (e.g. ANI).

33. A method for interfacing a telephonic communication system according to claim 32, further comprising the step of:

selectively extracting said pay to dial billing data.

34. A method for interfacing a telephonic communication system including remote terminals for individual callers to make individual calls with a multiple port, multiple format data processing system and a plurality of live operator attended terminals, said multiple port, multiple format data processing system for concurrently processing data from said remote terminals according to a plurality of formats, at least one of said formats having at least one condition for said remote terminals calling to interface said data processing system, and wherein said telephonic communication system provides certain call data signals, said method comprising the steps of:

receiving said certain call data signals from said telephonic communications system for said remote terminals calling to interface said data processing system including DNIS automatically provided by said telephonic communication system;

selecting for said remote terminals, a specific pay to dial processing format from said plurality of formats of said multiple port, multiple format processing system under control of said call data signals including DNIS;

testing said specific pay to dial processing format in relation to additional call data signals indicative of caller telephone number to provide approval signals; and

5,351,285

21

conditionally interfacing said specific pay to dial processing format to said remote terminals under control of said approval signals.

35. A method for interfacing a telephonic communication system according to claim 34, wherein said certain call data signals automatically provided by said telephonic communication facility include equipment data.

36. A method for interfacing a telephonic communication system according to claim 35, further comprising the step of:

automatically providing calling numbers (e.g. ANI) from said telephonic communication system as additional call data signals.

37. A method for interfacing a telephonic communication system according to claim 36, further comprising the step of:

testing said calling numbers (e.g. ANI) to specify use history conditions relating to said specific pay to dial processing format, for each of said individual calling terminals.

38. A method for interfacing a telephonic communication system according to claim 34, further comprising the step of:

testing to limit access of said remote terminals to a one time only use.

39. A method for interfacing a telephonic communication system according to claim 36, further comprising the steps of:

storing a record of negative file data, said specific pay to dial processing format accessing said record utilizing said automatically provided calling number data and obtaining data to specify and test for negative file conditions; and

terminating calls from said remote terminals if said calling number matches said data obtained from said negative file data.

40. A method for interfacing a telephonic communication system according to claim 39, wherein said test for negative file conditions is controlled by said calling numbers (e.g. ANI) automatically provided from said telephonic communication system as additional call data signals.

41. A method for interfacing a telephonic communication system according to claim 34, further comprising the steps of:

storing a record of positive file data, said specific pay to dial processing format accessing said record utilizing said caller telephone number data and obtaining data to specify and test for positive file conditions.

42. A method for interfacing a telephonic communication system according to claim 41, wherein said test for positive file conditions is controlled by calling numbers (e.g. ANI) automatically provided from said telephonic communication system as additional call data signals.

43. A method for interfacing a telephonic communication system according to claim 34, further comprising the step of:

processing certain select of said remote terminals calling to interface said multiple port, multiple format data processing system based on said call data signals to connect said remote terminals to one of said plurality of live operator attended terminals.

44. A method for interfacing a telephonic communication system according to claim 43, further comprising the step of:

22

automatically connecting certain of said remote terminals to certain of said plurality of live operator attended terminals where said individual callers are appropriately prompted.

45. A method for interfacing a telephonic communication system according to claim 34, wherein said testing step further comprises the step of:

executing a test based on historical limitations applied to an individual format and utilizing DNIS to control said test.

46. A method for interfacing a telephonic communication system including remote terminals with a multiple port, multiple format data processing system, said multiple port, multiple format data processing system for concurrently processing data from said remote terminals according to a plurality of formats, at least one of said formats having at least one imposed condition for said remote terminals calling to interface said data processing system, and wherein said telephonic communication system automatically provides call data signals, said method comprising the steps of:

receiving said call data signals from said telephonic communications system for said remote terminals including call data signals indicative of DNIS automatically provided by said telephonic communication system;

selecting for said remote terminals, a select processing format from said plurality of formats of said multiple port, multiple format processing system under control of said call data signals;

testing the select processing format in relation to said call data signals to limit access by said remote terminals to a one time use; and

conditionally interfacing said select processing format to said remote terminals responsive to said testing step.

47. A method for interfacing a telephonic communication system according to claim 46, further comprising the step of:

automatically providing calling numbers from said telephone communication system (e.g. ANI) as additional call data signals.

48. A method for interfacing a telephonic communication system including remote terminals with a multiple port, multiple format data processing system, said multiple port, multiple format data processing system for concurrently processing data from said remote terminals according to a plurality of formats, at least one of said formats having at least one imposed condition for said remote terminals calling to interface said data processing system, and wherein said telephonic communication system provides call data signals, said method comprising the steps of:

receiving said call data signals from said telephonic communications system for said remote terminals including DNIS and ANI automatically provided by said telephonic communication system;

selecting a pay to dial processing format from said plurality of formats of said multiple port, multiple format processing system under control of said call data signals including DNIS;

testing said pay to dial processing format in relation to said call data signals to provide test result signals;

conditionally interfacing said pay to dial processing format to said remote terminals responsive to said test result signals; and

5,351,285

23

storing billing provision data for each individual calling terminal based on said call data signals.

49. An interface control system for use with, (1) a communication facility including remote terminals for individual callers, wherein said remote terminals may comprise a conventional telephone instrument including voice communication means and digital input means for providing data, and (2) a multiple port, multiple format processor for concurrently processing data from a substantial number of callers in any of a plurality of formats, and (3) a plurality of live operator attended terminals with prompting capability for a plurality of formats, said interface control system comprising:

call data means for receiving signal-represented call data from said remote terminals including DNIS automatically provided by said telephonic communication system;

selection means coupled to said call data means for selecting one format from said plurality of formats of said multiple port, multiple format processor, said selection means being controlled by said signal-represented call data including DNIS to specify imposed conditions that must exist for a connection to said multiple port, multiple format processor, at least one of said formats having at least one imposed condition;

test means coupled to said selection means for testing said specified imposed conditions for said remote terminals to provide approval signals;

interconnect switch means coupled to said test means for providing connections from said multiple port, multiple format processor to said remote terminals under control of said approval signals; and

switch means coupled to said interconnect switch for switching to one of said live operator attended terminals based on call data representative of a remote terminal device.

50. A system according to claim 49, further comprising:

switch means for switching calls from said live operator attended terminal back to said multiple format processor for automated processing.

51. An interface control system for use with, (1) a telephonic communication facility including remote terminals for individual callers, wherein said remote terminals may comprise a conventional telephone instrument including voice communication means and digital input means for providing data, and (2) a multiple port, multiple format processor for concurrently processing data from a substantial number of callers in any of a plurality of formats, said interface control system comprising:

call data means for receiving signal-represented call data from said remote terminals indicative of DNIS automatically provided by said telephonic communication facility;

selection means coupled to said call data means for selecting one pay to dial format from said plurality of formats of said multiple port, multiple format processor, said selection means being controlled by said signal-represented call data to specify imposed conditions that must exist for a connection to said multiple port, multiple format processor, at least one of said formats having at least one imposed condition;

test means coupled to said selection means for testing said imposed conditions to provide approval signals;

24

interconnect switch means coupled to said test means for providing connections from said multiple port, multiple format processor to said remote terminals under control of said approval signals; and

record means for storing data representative of calls from said individual callers and pay to dial individual caller billing data, under the control of said signal-represented call data.

52. A method for interfacing a telephonic communication system according to claim 51, further comprising the step of:

automatically providing calling numbers from said telephone communication system (e.g. ANI) as additional call data signals.

53. An interface control system according to claim 51, wherein said individual caller billing data is based on a control word for each operating format which imposes the terms of said caller billing data.

54. An interface control system for use with, (1) a telephonic communication facility including remote terminals for individual callers, wherein said remote terminals may comprise a conventional telephone instrument including voice communication means and digital input means for providing data, and (2) a multiple port, multiple format processor for concurrently processing data from a substantial number of callers in any of a plurality of formats, said telephonic communication facility automatically provides call data signals, as to indicate called numbers to select a particular format from said plurality of formats, and (3) a plurality of live operator attended terminals with prompting capability for a plurality of formats, said interface control system comprising:

interface means for providing an introductory automated voice message relating to a specific format from said plurality of formats;

means for forwarding coupled to said interface means for forwarding a call from any one of said remote terminals to one of said plurality of live operator attended terminals;

means for processing coupled to said forwarding means for processing caller information data entered by an operator at said live operator attended terminal;

means for storing coupled to said processing means for storing certain select data from said caller information data entered by said operator; and

means for reconnecting said call to said interface means to receive certain processed data via an automated voice message.

55. An interface control system according to claim 54, wherein said call data signals automatically provided by said telephonic communication facility include data representative of said remote terminals.

56. An interface control system according to claim 55, wherein said automatically provided call data signals indicating called numbers and data representative of said remote terminals forward said call automatically to one of said plurality of live operator attended terminals.

57. An interface control system according to claim 54, wherein certain of said individual callers digitally enter data.

58. An interface control system according to claim 57, wherein said data entered by said individual callers is stored in said interface control system.

59. An interface control system according to claim 54, further comprising:

25

test structure to specify test conditions against which said caller information data entered by said operators is tested to provide approval signals and said call is interfaced with said specific format depending upon said approval signals.

60. An interface control system according to claim 59, wherein said test structure executes a test based on the history of said remote terminal.

61. An interface control system according to claim 54, wherein a plurality of called numbers are associated with said select processing format.

62. A method for interfacing a telephonic communication system including individual remote calling terminals for individual callers to make individual calls with a multiple port, multiple format data processing system and a plurality of live operator attended terminals, said multiple port, multiple format data processing system for concurrently processing data from said remote terminals according to a plurality of formats, at least one of said formats having at least one condition for said remote terminals calling to interface said data processing system, and wherein said telephonic communication system automatically provides call data signals, said method comprising the steps of:

receiving said call data signals from said telephonic communications system for said remote terminals calling to interface said data processing system indicative of DNIS automatically provided by said telephonic communication system;

selecting for said remote calling terminals, a select processing format from said plurality of formats of said multiple port, multiple format processing system under control of said call data signals, said plurality of formats including pay to dial processing formats;

testing use history conditions for said remote calling terminals when said select processing format is a pay to dial processing format to provide approval signals; and

conditionally interfacing said pay to dial processing format to said remote terminals under control of said approval signals.

63. A method for interfacing a telephonic communication system according to claim 62, wherein said automatically provided call data signals further indicate information indicative of said remote terminal devices.

64. A method for interfacing a telephonic communication system according to claim 62, wherein said testing step comprises the step of testing use history conditions for said remote calling terminals only for certain of said pay to dial processing formats.

65. An interface control system for use with, (1) a communication facility including remote terminals for individual callers to make calls, wherein said remote terminals may comprise a conventional telephone instrument including voice communication means and some of said remote terminals may further comprise digital input means for providing data, and (2) a multiple port, multiple format processor for concurrently processing data from a substantial number of callers in

5,351,285

26

any of a plurality of formats, said communication facility automatically provides call data signals with respect to pay to dial formats, as to indicate called data (DNIS) including equipment data, to select a particular format from said plurality of formats, and (3) a plurality of live operator attended terminals with prompting capability, for a plurality of formats, said interface control system comprising:

interface means for providing automated voice messages relating to a specific format to certain of said individual callers, wherein said certain of said individual callers digitally enter data through said digital input means;

means for directly forwarding a call coupled to said interface means for forwarding a call from any one of said remote terminals to one of said plurality of live operator attended terminals under control of said call data signals when said remote terminals do not have capability to digitally provide data;

means for processing coupled to said live operator attended terminals for processing caller information data entered by an operator at said live operator attended terminal; and

means for storing coupled to said interface means and said processing means for storing certain select data from said caller information data entered by said operator and data entered digitally by said individual callers.

66. An interface control system according to claim 65, wherein one of said pay to dial formats comprises a 900 number calling format.

67. A method for interfacing a telephonic communication system including remote terminals with a multiple port, multiple format data processing system, said multiple port, multiple format data processing system for concurrently processing data from said remote terminals according to a plurality of formats, at least one of said formats having at least one condition for said remote terminals calling to interface said data processing system, and wherein said telephonic communication system provides call data signals indicating called (e.g. DNIS) and calling (e.g. ANI) numbers, said method comprising the steps of:

receiving said call data signals from said telephonic communications system for said remote terminals indicative of DNIS and ANI automatically provided by said telephonic communication system;

selecting a pay to dial processing format from said plurality of formats of said multiple port, multiple format processing system under control of certain of said call data signals;

testing said pay to dial processing format in relation to said call data signals to provide test result signals;

conditionally interfacing said pay to dial processing format to said remote terminals responsive to said test result signals; and

storing billing provision data for each individual calling terminal based on said call data signals.

* * * * *

EXHIBIT 6

US005684863A

United States Patent [19]**Katz**[11] **Patent Number:** **5,684,863**[45] **Date of Patent:** ***Nov. 4, 1997**[54] **TELEPHONIC-INTERFACE STATISTICAL ANALYSIS SYSTEM**[75] **Inventor:** **Ronald A. Katz**, Los Angeles, Calif.[73] **Assignee:** **Ronald A. Katz, Technology Lic. L.P.**, Los Angeles, Calif.[*] **Notice:** The term of this patent shall not extend beyond the expiration date of Pat. No. 4,845,739.[21] **Appl. No.:** **476,662**[22] **Filed:** **Jun. 7, 1995****Related U.S. Application Data**

[63] Continuation of Ser. No. 335,923, Apr. 10, 1989, which is a continuation of Ser. No. 194,258, May 16, 1988, Pat. No. 4,845,739, which is a continuation-in-part of Ser. No. 18,244, Feb. 24, 1987, Pat. No. 4,792,968, which is a continuation-in-part of Ser. No. 753,299, Jul. 10, 1985, abandoned.

[51] **Int. Cl.⁶** **H04M 1/57; H04M 1/66; H04M 3/50; H04M 15/12**[52] **U.S. Cl.** **379/88; 379/91; 379/112; 379/142; 379/196; 379/245; 379/265**[58] **Field of Search** **379/88, 89, 67, 379/92, 91, 127, 142, 245, 246, 247, 201, 265, 266, 196, 197, 198, 112**[56] **References Cited****U.S. PATENT DOCUMENTS**

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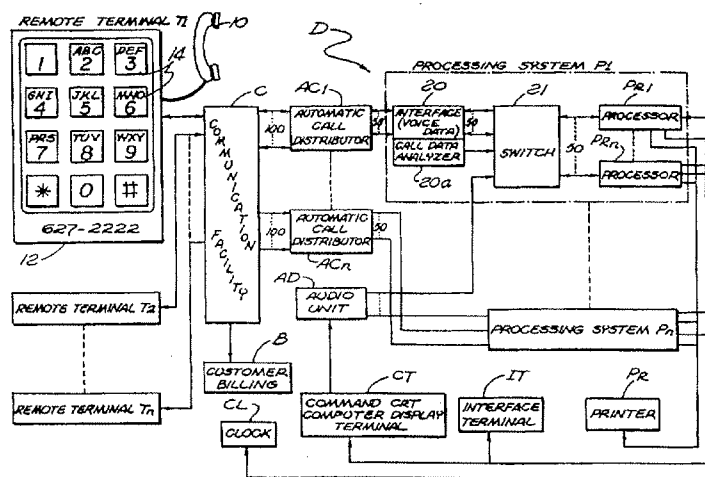
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[57] **ABSTRACT**

A system D interfaces with a multiplicity of individual terminals T1-Tn of a telephone network facility C, at the terminals callers are prompted by voice-generated instructions to provide digital data that is identified for positive association with a caller and is stored for processing. The caller's identification data is confirmed using various techniques and callers may be ranked and accounted for on the basis of entitlement, sequence or demographics. Callers are assigned random designations that are stored along with statistical and identification data. A break-off control circuit may terminate the computer interface aborting to a terminal for direct communication with an operator. Real-time operation processing is an alternative to stored data. The accumulation of stored data (statistical, calling order sequence, etc.) is variously processed and correlated as with developed or established data to isolate a select group or subset of callers who can be readily identified and reliably confirmed. Different program formats variously control the processing of statistical data as for auction sales, contests, lotteries, polls, commercials and so on.

202 Claims, 6 Drawing Sheets

5,684,863

Page 2

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U.S. Patent

Nov. 4, 1997

Sheet 1 of 6

5,684,863

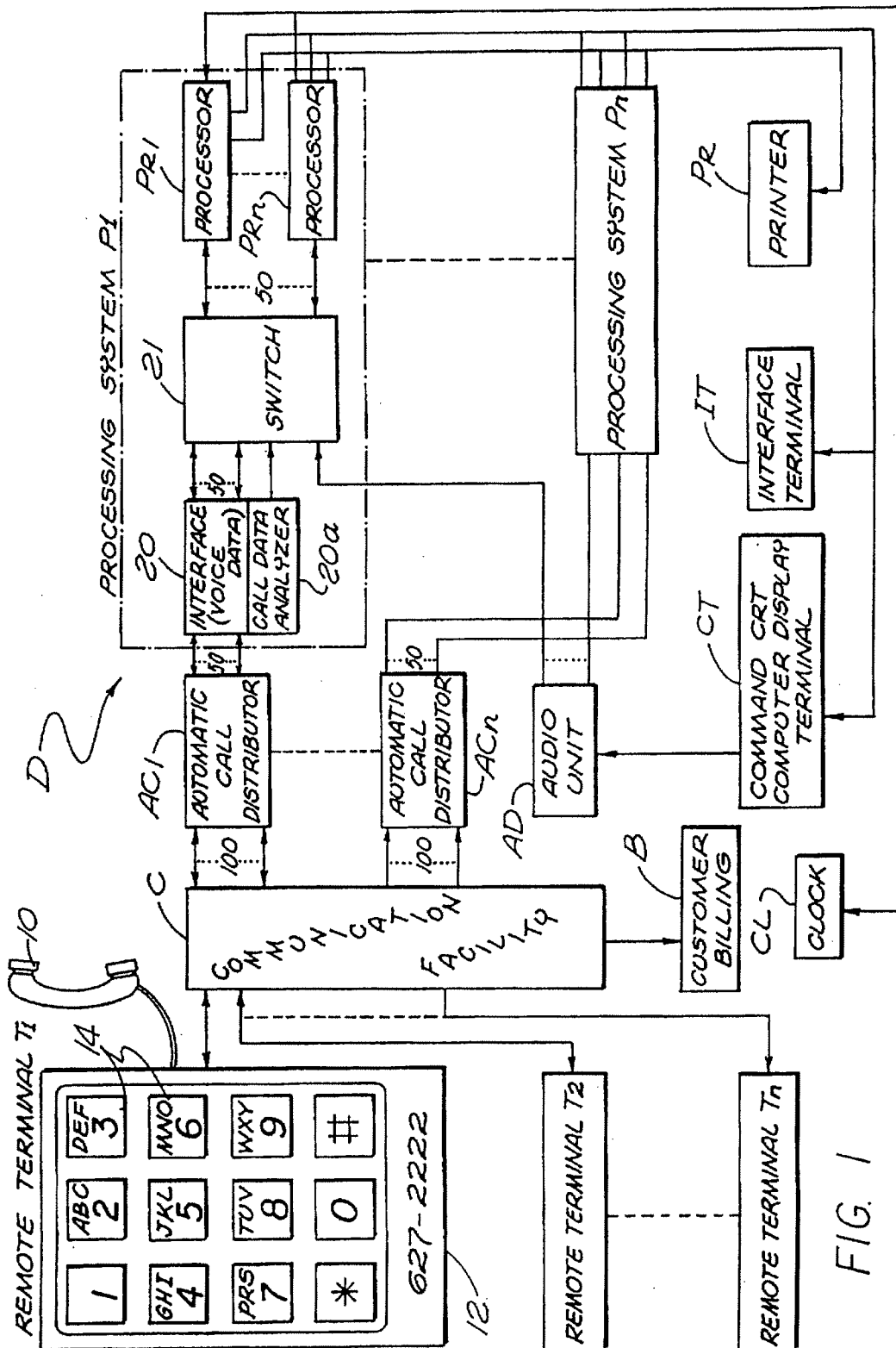


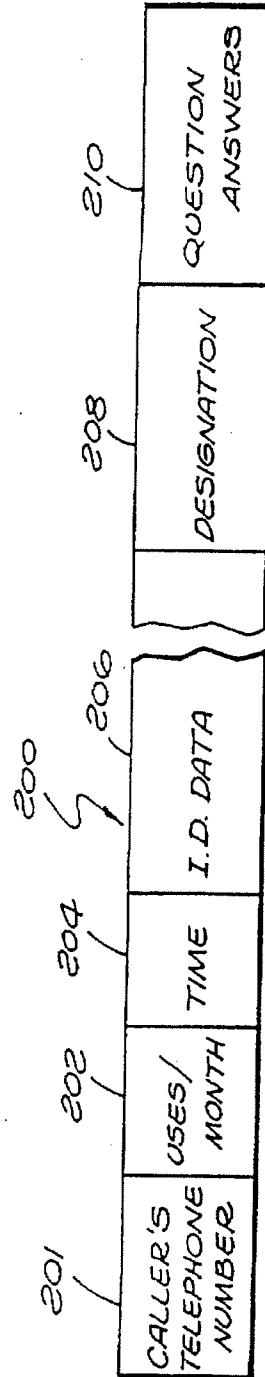
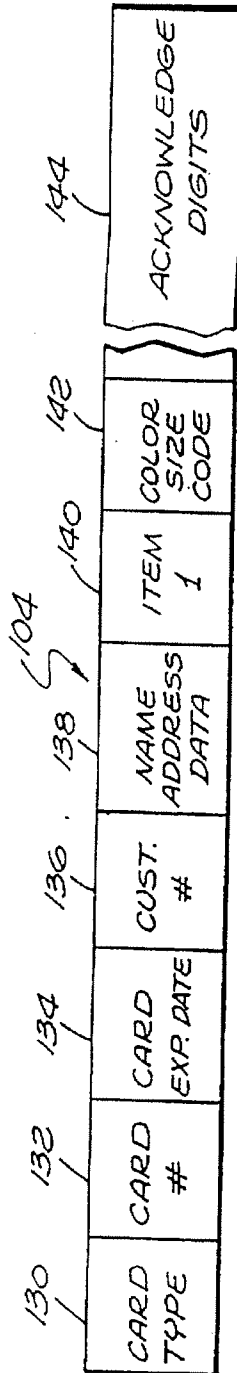
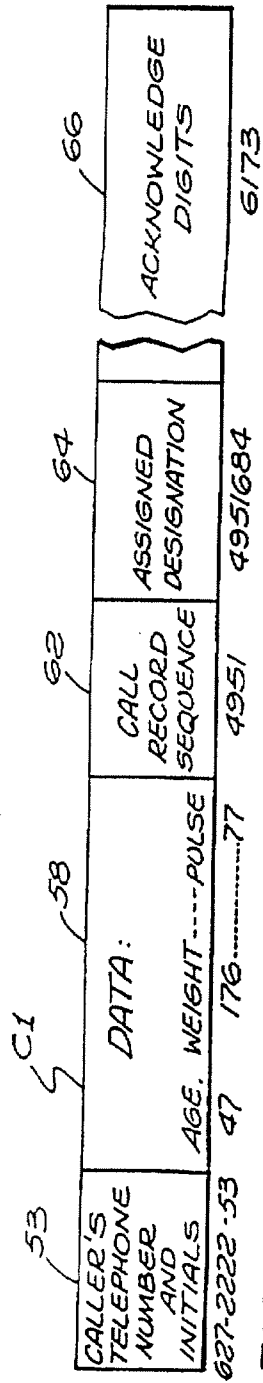
FIG. 1

U.S. Patent

Nov. 4, 1997

Sheet 2 of 6

5,684,863



U.S. Patent

Nov. 4, 1997

Sheet 3 of 6

5,684,863

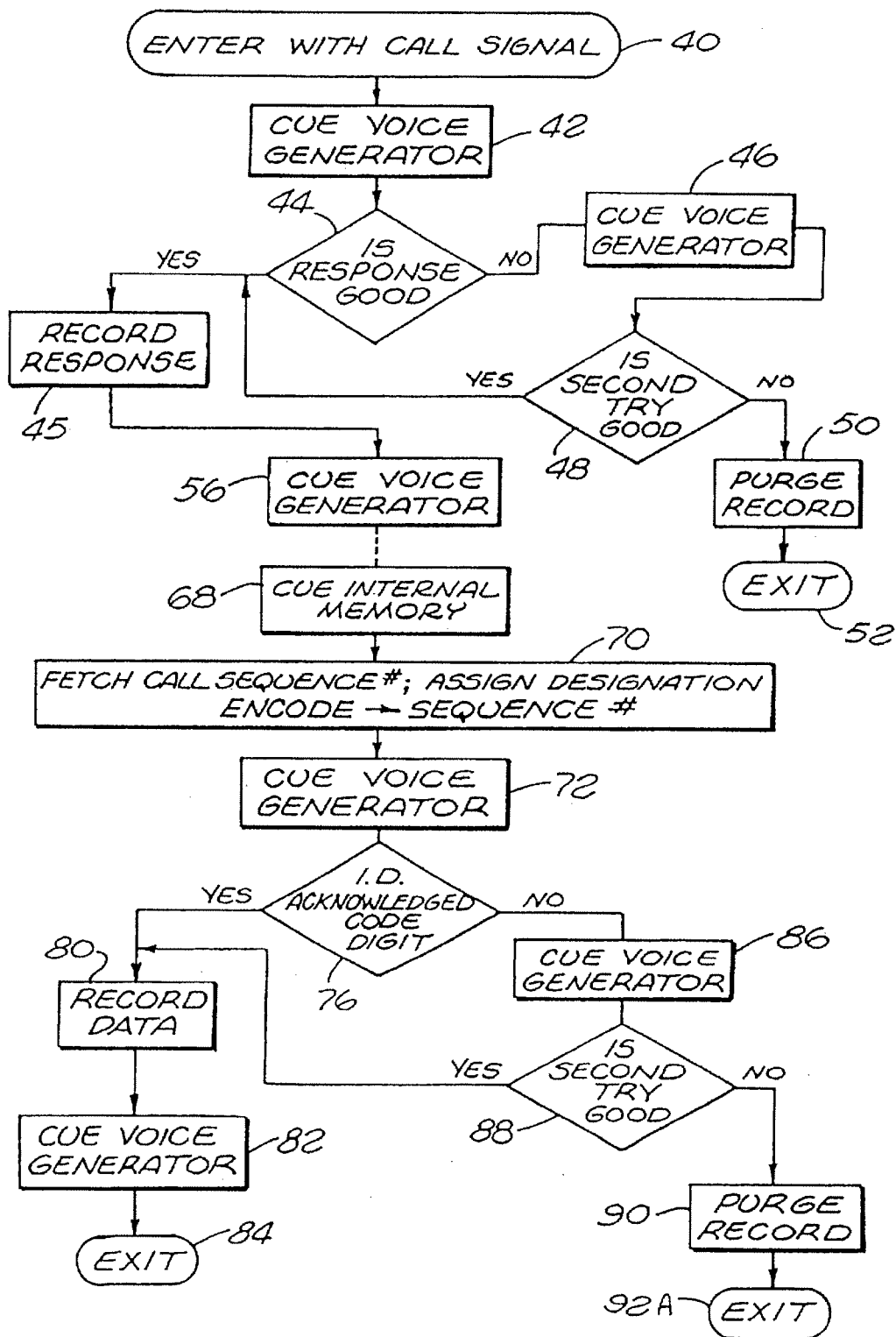


FIG. 3

U.S. Patent

Nov. 4, 1997

Sheet 4 of 6

5,684,863

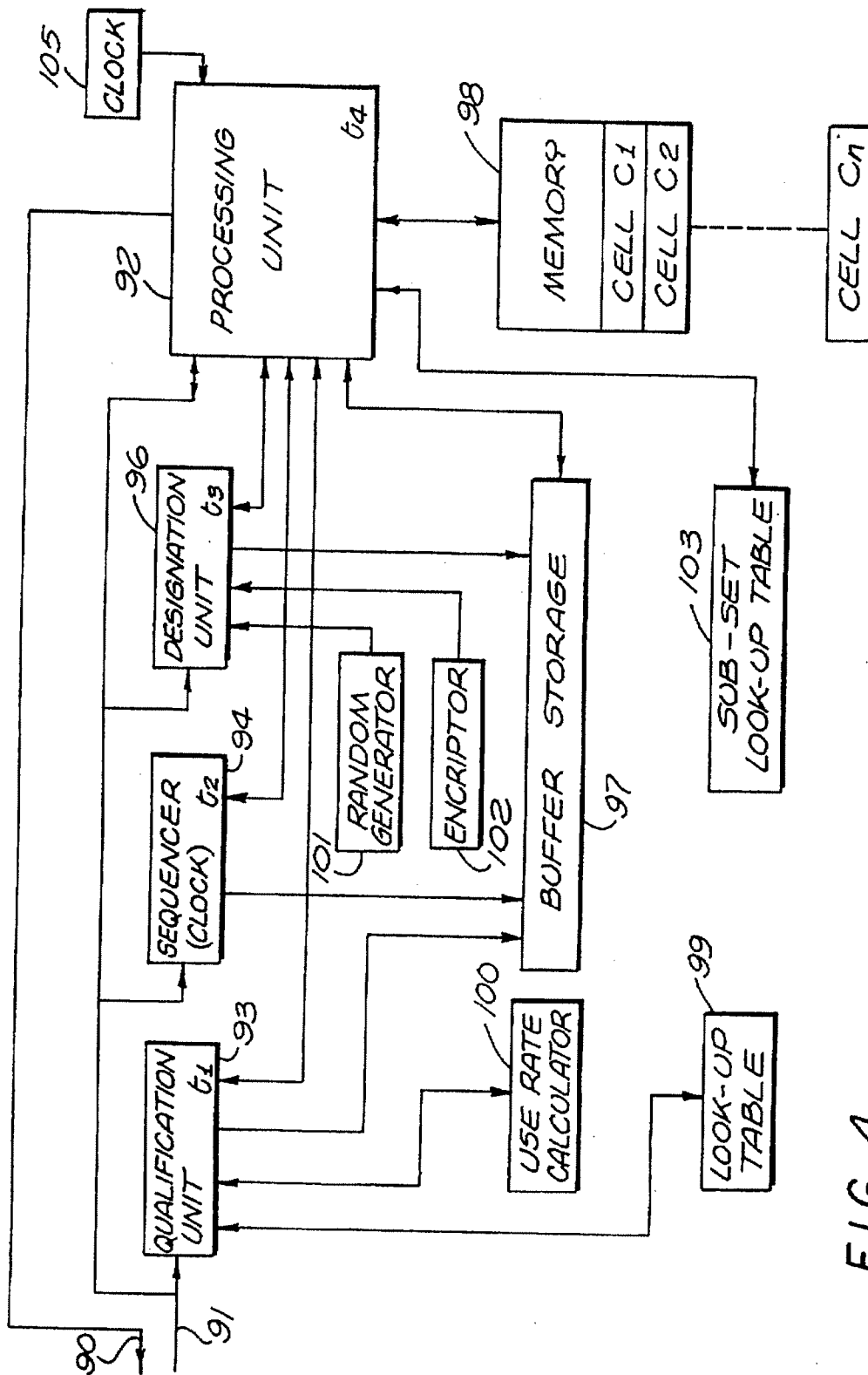


FIG. 4

U.S. Patent

Nov. 4, 1997

Sheet 5 of 6

5,684,863

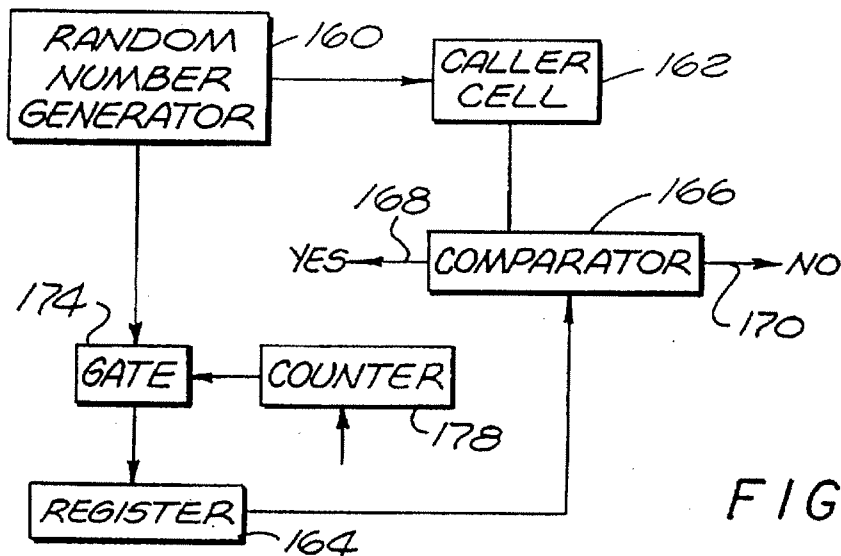


FIG. 6

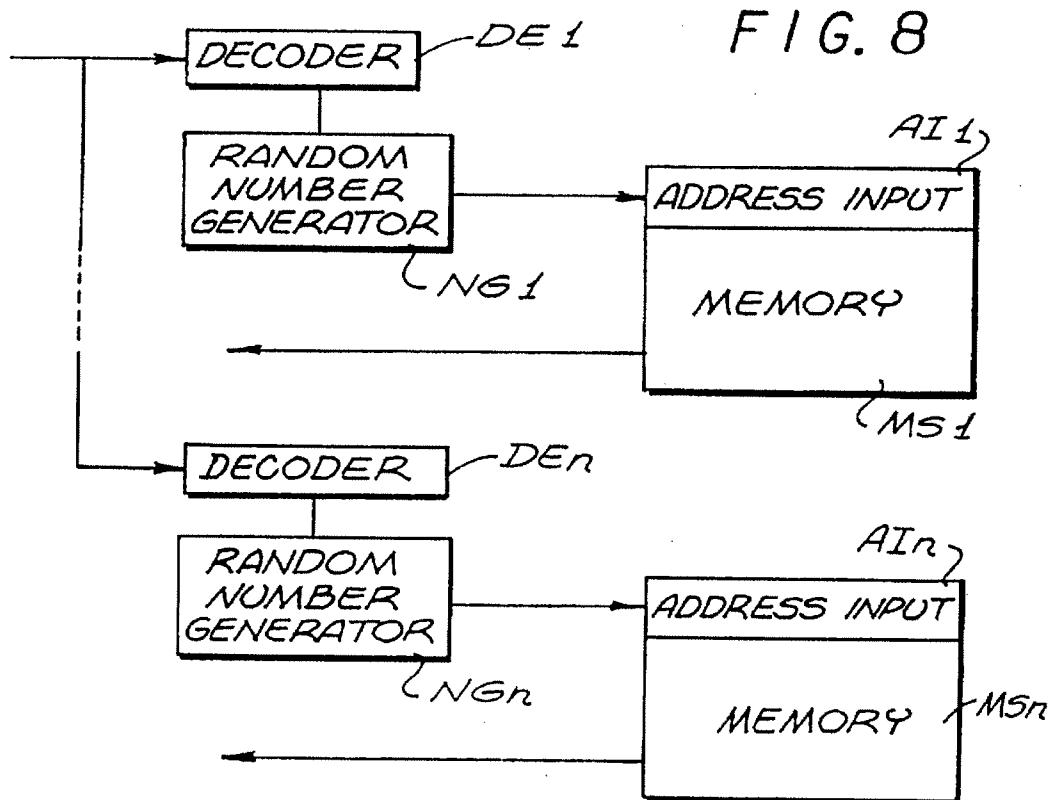


FIG. 8

U.S. Patent

Nov. 4, 1997

Sheet 6 of 6

5,684,863

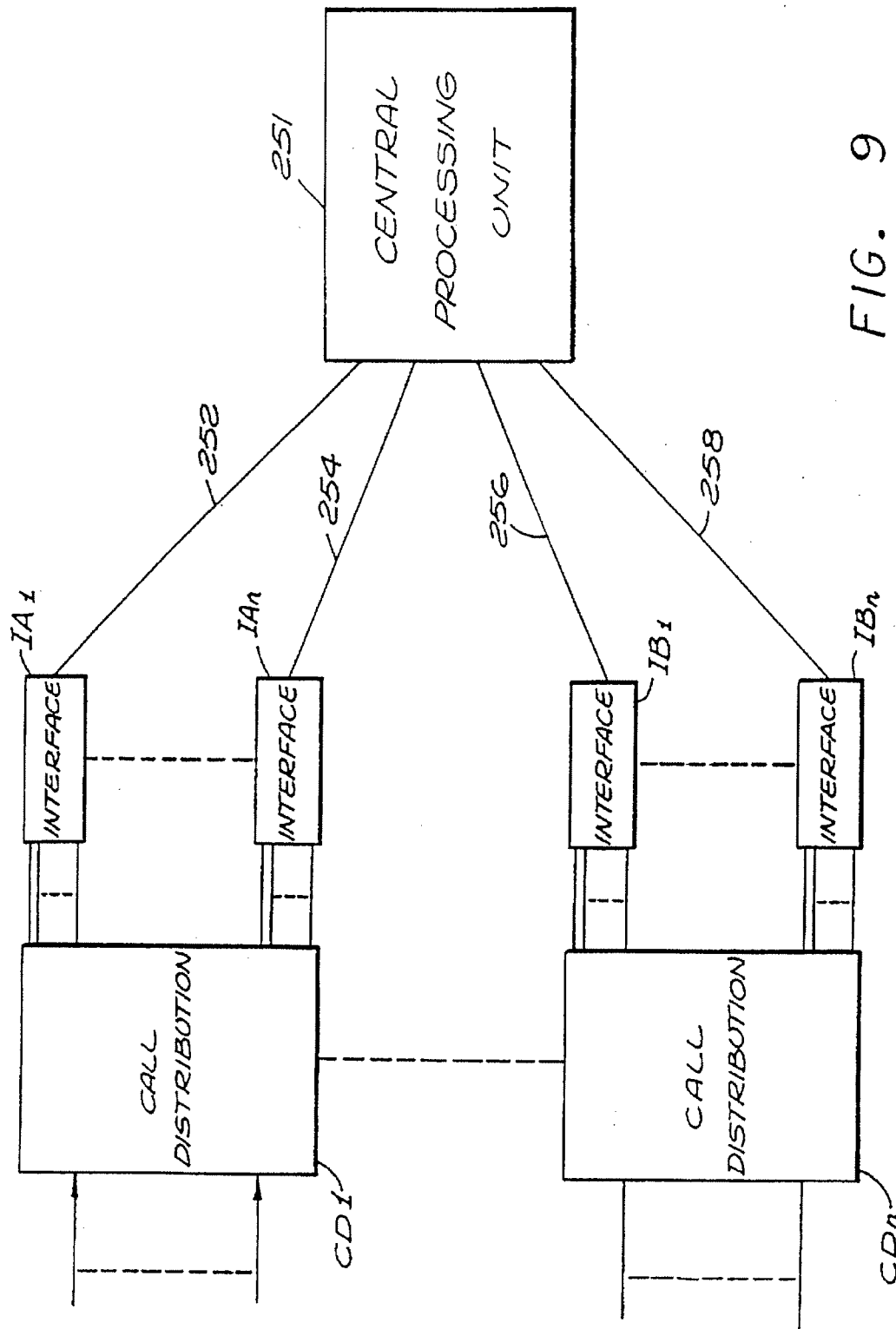


FIG. 9

5,684,863

1

TELEPHONIC-INTERFACE STATISTICAL ANALYSIS SYSTEM

This is a continuation application of application Ser. No. 07/335,923 filed Apr. 10, 1989, and entitled "Telephonic-Interface Statistical Analysis System", which is a continuation of application Ser. No. 07/194,258 filed May 16, 1988, and entitled "Telephonic-Interface Statistical Analysis System", now U.S. Pat. No. 4,845,739, which is a continuation-in-part of application Ser. No. 07/018,244 filed Feb. 24, 1987, and entitled "Statistical Analysis System For Use With Public Communication Facility", now U.S. Pat. 4,792,968, which is a continuation-in-part of application Ser. No. 06/753,299 filed Jul. 10, 1985, and entitled "Statistical Analysis System For Use With Public Communication Facility", now abandoned.

BACKGROUND AND SUMMARY OF THE INVENTION

Various forms of publicly accessible communication systems for providing access to a central station have been proposed, some involving telecommunications. However, sometimes a need for ancillary functions arise in that regard, e.g. it may be desirable to positively identify a large group of persons, as a demographically controlled group, or a specifically entitled group, then statistically analyze data from the group so as to accurately identify certain persons in the group and select a subset of at least one person. Specifically, it may be desirable to obtain medical data from an entitled group of people, to correlate such data, perhaps introduce external data, then identify a select subset of the group. In that regard, a need exists for an improved, effective, economical, and expedient system of telecommunication incorporating means for performing qualification, identification, analysis and selection of individual persons.

It has been proposed to interface persons at telephone calling stations directly with a computer facility. In accordance with such arrangements, recorded voice messages prompt callers to provide data by actuating the alphanumeric buttons that are conventionally employed for dialing from one telephone station to another. In one prior arrangement, a caller may actuate dialing buttons to selectively attain a communication channel or to address specific information in a computer. In another arrangement, dialing buttons may be actuated to specify a billing designation as for requested services. Generally, such systems are believed to have been somewhat limited in scope, often involving difficulties that are frustrating or confusing to a caller. Nevertheless, such techniques have been widely used to enhance and broaden communication.

In general, the present invention comprises a telephonic-interface system and related process for selectively utilizing both analog (voice) and digital telephonic communication in a variety of different interface formats or programs, as to select or qualify a set of callers, enable positive identification of at least certain of the callers in the set, acquire data from callers in the set, statistically analyze acquired data, as in combination and in association with external data (time independent), and accordingly to isolate a subset of the callers with verifiable identification. That is, the external data (separate from caller-provided data) may be introduced at any of a variety of different times in relation to the caller data.

For example, a voice origination apparatus may prompt individual callers who (after qualification) provide select digital data to develop a record for further processing either

2

immediately, upon the evolution of a defined set of callers or upon the establishment of select external data. Thus, following a qualification phase, the information acquisition phase may be concurrent or consecutive with respect to the processing phase. When appropriate, abort capability allows a caller to remain "off hook" and go to analog (vocal) communication. The caller then interfaces directly with an operator.

The system of the present invention may qualify an entitled set of callers, then receive answer data in the course of the call and develop identification or designation data, sequence data and statistical data. The system may then provide data cells for storing individual data while assigning confirmable identifications to the entitled set. From the set, a subset is defined. That is, in accordance with various formats, acquired data is processed in statistical relationship, or in relation to applied external data to accomplish such functional operating formats as an auction sale, a contest, a lottery, a poll, a merchandising operation, a game, and so on.

A variety of memory techniques are used to selectively activate the voice origination apparatus. Accordingly, statistical analysis and selection can be effectively and economically accomplished with respect to a substantial set of callers who are accommodated individual communication through a telephone system.

BRIEF DESCRIPTION OF THE DRAWINGS

In the drawings, which constitute a part of this specification, exemplary embodiments exhibiting various objectives and features hereof are set forth, specifically:

FIG. 1 is a block diagram of a system constructed in accordance with the present invention;

FIG. 2 is a fragmentary diagrammatic representation of a storage cell format as may be developed in the system of FIG. 1;

FIG. 3 is a flow diagram of one operating format of the system of FIG. 1;

FIG. 4 is a block diagram of a form of processor or function unit as may be employed in the system of FIG. 1;

FIG. 5 is a fragmentary diagrammatic representation of a storage cell format as may be developed in the system of FIG. 1 with the processor of FIG. 4;

FIG. 6 is a block diagram of elements in an operating function unit of FIG. 4;

FIG. 7 is a diagrammatic representation of a storage cell format as may be developed in the system of FIG. 4;

FIG. 8 is a block diagram of elements in an operating function unit of FIG. 4;

FIG. 9 is block diagram illustrating components of the system as spaced apart geographically.

DESCRIPTION OF THE ILLUSTRATIVE EMBODIMENTS

As required, detailed illustrative embodiments of the present invention are disclosed herein. However, physical communication systems, data formats, and operating structures in accordance with the present invention may be embodied in a wide variety of forms, some of which may be quite different from those of the disclosed embodiments. Consequently, the specific structural and functional details disclosed herein are merely representative; yet in that regard, they are deemed to afford the best embodiments for purposes of disclosure and to provide a basis for the claims herein which define the scope of the present invention.

5,684,863

3

Referring initially to FIG. 1, a series of remote telephone-instrument terminals T1 through Tn are represented (left). The terminals are generally similar, and accordingly, only the terminal T1 is illustrated in detail.

In the disclosed embodiment, the remote terminals T1 through Tn represent the multitude of conventional telephone terminals that are coupled to a communication facility C which may take the form of a comprehensive public telephone system for interconnecting any associated terminals T1-Tn. In accordance with the present system, the terminals T1-Tn operate through the communication facility C to be coupled with a central station D, an embodiment of which is illustrated in some detail.

Generally in accordance with the present development, individual callers use the individual telephone stations T1 through Tn to interface the station D through the communication facility C. Callers may be screened or qualified. Also in accordance herewith, the data of individual callers may be collected, correlated and tested in the station D for processing in accordance with various programs and external data. As a consequence, various objectives are accomplished. For example, a select subset of the callers may be isolated and specifically identified, or related data may be processed, or transactions may be actuated. The possibilities for application of the system are substantial and varied as will be apparent from the exemplary structure and functions as described in detail below.

In one operating process format, the public might be polled with regard to locating the specific purchasers of a defective or dangerous product. Alternatively, the public might be polled with the objective of locating persons susceptible to a specific ailment or disease. Public auctions of unprecedented participation are possible. Legal lotteries are enabled that are interesting, effective and very economical on an individual participant basis. The system also might be employed in various game formats or to automate a promotion or mail-order operation, even to the extent of including inventory control as detailed below.

In each functional operating format, the callers may be variously qualified on the basis of entitlement and may be identified for subsequent verification. The callers then may be prompted, either through the interface or externally, to provide appropriate data.

Considering the system of FIG. 1 in somewhat greater detail, it is to be understood that the communication facility C has multiplexing capability for individually coupling the terminals T1-Tn to the central station D on request. In the illustrative embodiment of the system, the communication facility C comprises a public telephone network and the individual terminals T1-Tn take the various forms of existing traditional or conventional telephone instruments.

The exemplary telephone terminal T1 is represented in some detail to include a hand piece 10 (microphone and earphone) and a panel 12 provided with a rectangular array of push buttons 14 in the conventional configuration. Of course, the hand piece 10 accommodates analog signals while the panel 12 is a digital apparatus. Generally in accordance herewith, the hand piece 10 serves to manifest analog signals vocally to the caller.

In accordance with conventional telephone practice, alphabetic and numeric designations are provided on the buttons 14. For example, several of the buttons 14 carry three letters along with a decimal digit. Specifically, the button designated with the numeral "2" also carries the letters "A", "B" and "C". In that manner, the buttons 14 encompass the numerals "0-9", two symbols, and the alpha-

4

bet except for the letters "Q" and "Z". Consequently, the buttons 14 accommodate the entry of decimal data, and to some extent alphabetic data.

The buttons 14 designated with symbols "*" and "#", along with the numeral "0", can be used by predetermined assignment to represent the letters "Q" and "Z" or any of a variety of other data or command components. Generally, in accordance herewith, the buttons 14 are employed to formulate digital data at the central station D in various formats determined by the instant specific use and operating format of the system.

Considering the central station D in somewhat greater detail, the communication facility C is coupled to interface a series of processing systems P1 through Pn (FIG. 1, left). Specifically, the communication facility C is connected to the processing systems P1-Pn through an associated series of automatic call distributors AC1 through ACn. Each of the automatic call distributors AC1-ACn accommodates one hundred lines from the communication facility C and accordingly, may accommodate and queue up to 100 calls.

Each of the automatic call distributors AC1-ACn may take various forms as well known in the prior art, functioning to queue incoming calls for connection to a lesser number of lines. In the disclosed embodiment, from each of the call distributors AC1-ACn, fifty lines are connected respectively to the individual data processing systems P1-Pn through an interface 20 and a switch 21. Thus, in the disclosed embodiment, each of the automatic call distributors AC1-ACn can accommodate one hundred lines, fifty of which may be active in association with one of the processing systems P.

The processing systems P1-Pn are similar, therefore, only the processing system P1 is shown in any detail. Collectively, the processing systems P1-Pn are interconnected with a command computer terminal CT, at least one interface terminal IT, at least one printer PR and an audio unit AD. The command terminal CT is separately coupled to the audio unit AD.

As represented, the processing systems P1 through Pn each contain a number of individual function units or processors PR1 through PRn. Although various other configurations and arrangements may be employed, the explanation is facilitated by including a plurality of individual function units as treated in detail below.

Considering the processing system P1, fifty lines from the automatic call distributor AC1 are connected to the interface 20, an exemplary form of which may be a commercially available Centrum 9000 unit. The interface 20 incorporates modems, tone decoders, switching mechanisms, DNIS and ANI capability (call data analyzer 20a) along with voice interface capability. Note that the interface may actually perform analysis on data. However, to preserve the disclosed embodiment manageable, major analysis is explained with reference to processors.

Generally, DNIS capability is a function of the communication facility C (composite telephone system) to provide called terminal digital data indicating the called number. ANI capability is a similar function whereby the digital data indicates the calling number with calling terminal digital signals. Both capabilities are available for use with equipment as the interface 20 and to provide control through the call data analyzer 20a.

Accommodating up to fifty independent calls on separate communication paths to the central station D, the interface 20 is capable of providing analog (voice) signals to prompt each caller. Also accommodated are digital signals including

5,684,863

5

the DNIS and ANI signals. The system contemplates the possibility of utilizing sequences of lines in rotary as well as blocking sequences of lines, the numbers for which command a particular program or operation format of a function unit as disclosed in detail below.

The interface 20 provides the connection of the fifty lines to a switch 21 which is in turn coupled to fifty function units, or processors PR1-PRn. As indicated above, multiple function units, or processors, are described in the disclosed embodiment to facilitate the explanation. Of course, non-parallel techniques and multiplexed operations might well be employed as alternatives. For a similar reason, as disclosed herein, each of the processors PR1-PRn includes memory cells for each of the callers' individual data. Development and compilation of data in such cells according to various operating formats is described below. In the disclosed embodiment, the processors PR1-PRn are connected collectively to the command computer terminal CT (incorporating a CRT display), the interface terminal IT, and the printer PR. Note that the CRT display serves to visually display data regarding select subsets as explained in detail below.

Exemplary detailed structures for the processors PR1-PRn are described below; however, in general, the units may comprise a microcomputer, for example, programmed as suggested above and as disclosed in detail below to accomplish specific operating formats. As an integral part of such formats, a caller may be qualified as belonging to an entitled set of persons or to accommodate specific demographic objectives. Also, callers may be designated both with respect to their significance and their identification. For example, callers may have different significance in a format, depending on the time or sequence of their call. Also, the designation of a caller may be exceedingly important in relation to the caller eventually being isolated as part of a subset, the members of whom must be accurately verified. As described below, the designations may involve multiple elements which may include: random number assignments, encryption techniques, utilization of calling numbers, identification data, sequence of call and so on to facilitate reliable verification. Note that the communication facility C has a customer billing structure B that is interfaced by the system.

On the qualification and designation of callers, the system enters a data accumulation phase during which digital data (formatted at one of the telephone terminals T1-Tn) is processed by one of the processors PR1-PRn. In general, the processing evolves a subset (at least one caller) the members of which may be verified and confirmed.

Either during the data accumulation phase, or after the processing phase to isolate a subset, a distinct operation may involve actuating the interface terminal T1 for direct local communication between the caller and an operator at the terminal T1. Another distinct operation may involve actuation of the printer PR to provide documents in relation to the operating format, as for providing award certificates as for verifying members of an isolated subset. Also, charge slips may be generated containing at least part of the data of a particular transaction.

An appreciation of the philosophical operation of a system in accordance with the present invention may now be enhanced by considering an exemplary operation of the illustrative embodiment of FIG. 1 to isolate a subset of people who are susceptible to a particular disease or infirmity. The exemplary operation might involve a geographical area, as a large city or population center, in which a

6

particular health problem is somewhat acute. For example, a major population center might be polled where coronary artery disease is a significant problem. Accordingly, persons most susceptible to such disease could be identified for corrective recommendations.

People of the population center could be informed of the availability of a service for statistical health analysis. Accordingly, persons interested in their individual statistical situation would be motivated to utilize the service. Specifically, individual callers would use the remote terminals T1-Tn to contact the central station D through the communication facility C and thereby provide personal information that would enable a statistical analysis in relation to existing data so as to isolate and inform (either real time or batch basis) those persons statistically most likely to be in need of corrective measures. In such applications, it may be important that the caller's identity be subject to reliable verification. Other applications or programs also may present a critical need for positively verifiable identification to the extent that credit card numbers and/or personal identification numbers may be employed.

An exemplary operation of the system, with regard to a specific caller, will now be treated referring somewhat concurrently to FIGS. 1, 2 and 3. As indicated above, FIG. 2 indicates a data storage format for a memory cell in an exemplary processor PR and now will be considered with regard to an operating format in which data is composed for a caller. Pursuing the above example, assume the existence of a caller at the remote terminal T1 (telephone number (213) 627-2222) who wishes to pursue health-related information on the basis of statistical analysis. The caller lifts the hand piece 10 and in accordance with conventional techniques actuates the push buttons 14 to call for a select operating format, e.g. telephone number (213) 627-3333 and thereby establish communication through the facility C with a designated function unit in the central station D. Receiving the call signal, the automatic call distributor AC1 associates the called number ((213) 627-3333, rendered available using standard telephone DNIS techniques) through the interface 20 and the switch 21 to attain connection with the specific processor, e.g. the processor PR1 formatting the health-related program. Accordingly, the processor PR1 cooperates with the interface 20 to cue the interface 20 to operate as a voice generator.

The sequence of operations is represented to be initiated in FIG. 3 by the "enter" block 40 which is accordingly followed by a "cue voice generator" command block 42. If the ANI equipment is not employed, the voice generator in the interface 20 formulates speech, a representative form of which might be: "Thank you for participating in the coronary artery disease statistical analysis. Please give us your telephone number by actuating the call buttons on your telephone instrument."

Acting on the instructions, the caller would push the buttons 14 in sequence to indicate his telephone number, e.g. "(213) 627-2222". Alternatively, the interface 20 can accept the calling number ((213) 627-2222) according to its provision by standard ANI equipment of the communication facility C.

The resulting data signals are communicated from the interface unit 20 (FIG. 1) to the processor PR1 for testing the telephone number as valid or entitled. Essentially, the format of a proper number prompts production of a valid or "good" signal. The test is indicated by the block 44 (FIG. 3). If the response is not valid or entitled, for example contains an inappropriate number of digits or has been used to a point of

5,684,863

7

excess, the operation of block 46 is initiated again cuing the voice generator 30 (FIG. 1). The voice generator accordingly instructs the caller, e.g.: "You have not entered a proper telephone number. Please reenter your telephone number by pressing the appropriate call buttons." The caller is then allotted a predetermined period of time to make a proper entry with the consequence that the system moves to a test operation as indicated by the block 48 (FIG. 3). Specifically, block 48 poses the query: "Is the second try good?"

If the caller is again unsuccessful, the system purges the record as indicated by the block 50 and the call is terminated as indicated by the block 52. In an alternative mode, the processor PR1 may abort the interface and couple the interface terminal IT for direct personal communication with the caller. The interchange would then proceed, person-to-person.

If the caller responds with a proper telephone number, the operation proceeds. Specifically, the system sequences to record the response of the proper telephone number as indicated by the block 45. That is, the caller's telephone number is recorded in an assigned specific memory cell identified with the caller. The format of the cell C1 is indicated in FIG. 2. The first portion, section 53, contains a form of identification data, i.e., the caller's telephone number, i.e., "(213) 627-2222".

Note that as explained above, if the second attempt to formulate a proper number is successful, as manifest by the block 48 (FIG. 3), the response recorded at that stage. In either case, exiting from the block 54 (FIG. 3) invokes the next operation of again queuing the voice generator as indicated by the block 56.

As an alternative format, if a selective-group polling operation is performed, or callers are otherwise to be cleared for entitlement as mentioned above, a caller may be qualified by providing a "one-time" key number. The processor PR1 may incorporate a look-up table for proper, key numbers which numbers may be coded using any of a wide variety of techniques. As a simple illustrative example, the key may comprise a precise number of digits that always total a particular numerical value.

The system proceeds after the caller is qualified. Specifically, the cue to the voice generator of the interface 20 (FIG. 1) as represented by the block 56 produces a request for further information from the caller with further identification data and answer data. For example, the voice generator might request information by stating: "Please use the telephone buttons to indicate initials of your name."

The detailed operation is not represented in FIG. 3 as it is similar to the operation illustrated by the blocks 42 through 54. However, again, a proper response is registered in the storage cell C1 as illustrated in FIG. 2 by the number "53" also registered in the first section 53 of the cell.

The cycle of obtaining digital information from the caller next is repeated with respect to answer data, i.e. specific health data. For example, as illustrated in FIG. 2, the next section 58 in the cell C1 receives an accumulation of health data, including the caller's age, weight, . . . , pulse rate, and so on. Representative digital numbers are illustrated in FIG. 2.

During the course of the telephonic communication, the processor PR1 formulates identification data for the caller specifically including: the chronological sequence of the call, the assigned designation of the call, and a set of acknowledgment digits for the call. Such data identification is registered in the caller's assigned cell C1 in accordance

8

with the format of FIG. 2 being stored in sections 62, 64 and 66. Note that the data may be stored in a coded interrelationship. For example, the acknowledgment digits may be related to the call record sequence. In the illustrative example, the chronological order number of the caller is 4951. The acknowledge digits may be derived from the sequence number. For example, as illustrated, a coded relationship may be established by adding "two" to each of the individual record sequence digits. Considering the example numerically:

Adding without propagated carries:

4951
2222
 6173

Note that the confirmation data as acknowledgement digits can be extremely important, as to communicate with an isolated member of a subset. For example, identification could be published or circulated, as by a television broadcast, then respondents checked by use of confirmation data that may be confidential.

Continuing with the above example, the call chronological sequence registered for the caller is 4951 as represented in the section 62 while the acknowledge digits are 6173 as registered in the section 66. Additionally, the processor PR1 develops an assigned designation number, e.g. designation "4951684", which is registered in the section 64, the acknowledge code or digits, e.g. 6173, being registered in the section 66. These values are formulated in accordance with conventional number techniques during the data acquisition phase. With the exemplary numerals formulated, the operation proceeds.

The processor PR1 (FIG. 1) cues the internal memory. That operation is indicated by the block 68 (FIG. 3). Thus, the processor PR1 fetches the call record sequence number, assigns a designation (if not previously assigned), and encodes the sequence number as the acknowledgment digits (if not previously accomplished). These operations are indicated by the block 70 (FIG. 3).

Next, the processor PR1 (FIG. 1) cues the voice generator in the interface 20, as indicated by the block 72 (FIG. 3) to provide information to the caller. Specifically, for example, the voice generator in the interface 20 (FIG. 1) might signal: "This transaction has been designated by the number 4951684, and is further identified by the acknowledgment digits 6173. Please make a record of these numbers as they will be repeated. Specifically, the designation number is 4951684. The acknowledgment digits are 6173. Please acknowledge this transaction by pressing your telephone buttons to indicate the acknowledge digits 6173." In various applications as those involving security, the order and acknowledgment of callers may be very important. Therefore, data for confirmation associated with the order is important.

The system next proceeds to the test mode as indicated by the block 76 (FIG. 3). If the caller provides the correct acknowledgment digits, the data is confirmed in the record as indicated by the block 80 and is registered in the cell C1 (FIG. 2). Additionally, the voice generator is sequenced as indicated by the block 82 (FIG. 3) to indicate the close of the communication and that the transaction is terminated as represented by the exit block 84.

In the event that a caller cannot confirm his acknowledgment digits, as indicated by the block 76, a repeat operation is performed as indicated respectively by the blocks 86 and

5,684,863

9

88. Specifically, the voice generator is queued for a second instructional message. In the event that the second attempt also fails, the data is purged and the call discounted as indicated by block 90 and an exit block 92A. If the second try is successful (test block 88), as indicated by the block 80, the record is perfected as indicated above.

As a result of the likelihood of a large number of calls, as described above, data cells in the processors PR1-PRn (FIG. 1) are developed with specific information indicative of a statistical sampling of the populace of concern. The data of that statistical sampling may be self-generating of specific conclusions with respect to a subset of individuals, and/or supplemental data to clearly manifest a significant subset. For example, the data may indicate a significant departure from an assumed normal characteristic. Such data, accumulated from the polling may be considered by logic comparisons in the computer 22 to select the subset of persons who should be isolated.

In addition to the self-generating conclusions available from the received data, the system may involve the introduction of external data. In the physical fitness example, such external data might take the form of national statistical data. In any event, the processing operation usually involves comparison testing which compares caller data from individual memory cells of the processors P1-Pn (FIG. 1) with test data that is supplied through the command terminal CT.

In the above example, members of the public in general were invited to use the service. A number of alternatives exist which might well impact on the statistical analysis. For example, a list may be preserved by a use-rate calculator to implement a consumable key operation. That is, a user is qualified to a specific limited number of uses during a defined interval.

As another example, callers might be restricted to the purchasers of a specific product as a medical apparatus for measuring blood pressures, heart rates, or so on. In such situations, it will be apparent that the statistical data will be somewhat distorted from an average or normal sampling. Clearly, the processors P1-Pn can be programmed to take into account such considerations. In that regard, the processors might also verify identification data proffered by a caller. Such data might take the form of a credit card number or a personal identification number. Methods for verification of such numbers using computer techniques are discussed below.

As indicated above and detailed below, the system can be programmed or formatted for use in a variety of applications. Preliminary to considering exemplary forms of such applications, reference will now be made to FIG. 4 showing an exemplary structural form for the processors PR1-PRn. From the switch 21 (FIG. 1) a pair of communication lines 90 and 91 are indicated in FIG. 4 (top left). The line 90 provides signals from a processing unit 92 while the line 91 provides signals to the processing unit 92 along with other components as represented in FIG. 4. The separate lines 90 and 92 facilitate explanation.

The processing unit 92 may take the form of a mini-computer programmed to accommodate the functions of various applications, as disclosed in detail below. As indicated above, the system may utilize a plurality of independent function units or processing units, e.g., processing unit 92, operating in a somewhat parallel configuration, or alternatively, a limited number of processors may be driven sequentially to accommodate the functional operations as described.

The input line 91 (upper left) is connected specifically to a qualification unit 93, a sequencer 94 and a designation unit

10

96, as well as the processing unit 92 as indicated above. The qualification unit qualifies access from a remote terminal T1-Tn to the processing unit 92 as described in detail below. In accordance with various applications or operating formats, the qualification unit 93, the sequencer 94 and the designation unit 96 operate preliminarily with respect to individual callers. Generally, these units qualify or test callers for entitlement, develop a sequence-of-calls record and provide forms of designations for callers that may be authenticated. As described in detail below, the units function in sequence to accomplish such operations and accordingly are each individually connected to the processing unit 92 and a buffer storage 97. Essentially, the buffer storage 97 is illustrated separately from the processing unit 92 along with the unit 93, sequencer 94, unit 96, and so on, again in order to facilitate the explanation. Similarly illustrated are a memory 98 (with cells C1-Cn), a look-up table 103 and a clock 105.

Considering the processor of FIG. 4 in further detail, the qualification unit 93 (upper left) is connected to a look-up table 99 and a use-rate calculator 100. The designation unit 96 (top center) is connected to a random number generator 101 and an encryptor 102.

In view of the above structural description of the system, consideration will now be given to certain specific applications in relation to the operation of the system. In that regard, the operation of the system will next be considered to automate a mail-order facility.

Assume that a caller at a terminal T1 (FIG. 1) dials a specific number to identify a mail order interface with the system of FIG. 1. For example, assume the telephone number "(213) 627-4444" for such an interface. Accordingly the caller dials the number at the remote terminal T1. As a result, the communication facility C couples the terminal T1 through the automatic call distributor AC1, the interface 20 and the switch 21 to a select processor PR1 identified and programmed for a mail-order operating format. Note that the communication facility C provides the dialed number ("(213) 627-4444") to the processing system P1 through well known telephonic equipment DNIS. Accordingly, a program is selected to execute the mail order interface.

As a preliminary action, a voice responder in the interface 20 might be cued by the processing unit to identify the mail-order house and indicate that the order will be taken by computer. Either before or after qualification, the caller might be advised that if he prefers to communicate directly with a person, or needs such contact at any point in the communication, he may accomplish it simply by pushing the asterisk button (*) at the terminal T1. Such action forms an abort signal that is detected by the processing unit 92 to transfer the communication to the interface terminal IT (FIG. 1). Alternatively, the customer maybe asked (by voice cue) to provide detailed information as name, address, etc. which is recorded for later processing.

After the preliminary information is supplied to a caller, the qualification phase is initiated. For example, the interface 20 might actuate the terminal T1 to announce: "Please indicate the type of credit card you will use for your purchase by pushing the button number 'one' for Mastercharge, 'two' for . . ."

The caller's response, indicating a specific credit card, will be stored in a data cell; however, the data is developed initially in the buffer 97. The format and data for the present example (in the buffer 97) will be explained with reference to a storage block format 104 as illustrated in FIG. 5. The first data block 130 accordingly registers a digit to indicate the card that will be used to support the caller's purchase.

5,684,863

11

Using voice prompt, the interface 20 next instructs the caller to use the telephone buttons to indicate his credit card number and the expiration date of the card. That data is stored in the register 104, specifically in the blocks 132 and 134 as illustrated in FIG. 5.

Next, the caller is asked for his customer number, as it may appear on his catalog. That number is stored in a block 136 of the block format register 104. Note that the caller may not be identified in the files of the mail-order house and in that event, the operation may be shifted to a manual operation to be continued through the interface terminal IT (FIG. 1) as explained above. For a television-initiated mail-order transaction, other numerical codes might be employed as to key into broadcast schedules. For example, a code might be used to indicate program times and thereby enable evaluation of the productivity of such program times. Such operation may be performed during the designation-phase as described below.

To continue with the explanation of the automated format, assume that the customer has a file customer number and that it is stored in the block format register 104 along with his credit card number and expiration date. From that location, the data is checked by the qualification unit 93 (FIG. 4) for propriety as part of the test or qualification phase of operation. The check or test is in two stages and both are performed during an interval designated t1, the qualification unit 93 operating under control of the processing unit 92.

First, the data is verified as representing valid and proper data formats for the customer's number, the credit card number and expiration date. The second operation involves consulting a so-called negative list to assure that the identified card and customer's number have not been cancelled, as for example in the case of credit cards that have been lost or stolen. Detailed structure for such tests is described in the parent case from which this case continues and may be incorporated in the qualification unit 93.

With the successful completion and verification of the preliminary data in the block format register 104, the qualification phase of operation is concluded and the system next interfaces with the caller to acquire and process data for a specific order of merchandise. Note that in the mail-order operating format, the sequence of the call is not normally significant. However, the sequencer 94 may log the time during a period t2 if deemed worthwhile.

Somewhat as described above in relation to the initial operating format (health poll), the voice generator in the interface 20 prompts the caller through a series of exchanges that load the storage block format register 104 with a merchandise order. Thus, as purchase items are confirmed, the register 104 is loaded as exemplified by the blocks 140 and 142. The interchange continues until the customer indicates he does not wish to order any additional items. The system then operates the designation unit 96 (FIG. 4) during the interval t3 to develop and announce the acknowledgement digits as stored in the block 144 (FIG. 5). The acknowledgement digits serve to identify the order both for the caller and the mail-order house. Accordingly, tracing is facilitated. The data (FIG. 5) is then transferred from the buffer 97 (FIG. 4) to a select memory cell C1-Cn.

During the next interval t4, the processing unit 92 (FIG. 4) isolates data of the cells C1-Cn to facilitate the mail-order process. In that regard, the processor 92 may incorporate structure and processing techniques as disclosed in the parent case.

Of the wide variety of other operating formats and applications in accordance herewith, further examples will now

12

be described with reference to the systems of FIGS. 1 and 4. However, from a consideration of the operating formats treated below, it will be apparent that certain structural elements have reoccurring significance in the combination. Specifically, such elements include the structures: (1) utilizing the called number to select a specific operating format, (2) for screening or selecting callers who will be accepted-based on various criteria, (3) for designating callers in a manner to enable subsequent positive identification and (4) various processing aspects of the data manipulations including the provision of at least a portion of certain ID data provided directly from, the telephone apparatus. With respect to the data processing, distinctive elemental features include the utilization of external data not available during the interval of gathering data, the utilization of an interrelationship between the composite data collected during a data acquisition period, and the operation of utilizing time or sequence of callers to accomplish a subset.

As the next illustrative operating format, an instant lottery system will be described. Accordingly, assume the existence of a legalized state lottery accommodated by the telephone system utilizing a pay-to-dial number ("(213) 976-xxxx") and restricted to a limited number of uses for defined intervals of time. For example, a person might be entitled to play the lottery a limited number of times or to the extent of a limited dollar value during a predetermined interval.

From the terminal T1 (FIG. 1) the caller would actuate the push buttons 14 to establish contact with the processing system P1 and coupling would be through the communication facility C, the automatic call distributor AC1, the interface 20 and the switch 21 as described in detail above. The initial operation then involves qualification of the caller to participate in the instant winner lottery. Again, ANI or caller interface techniques may be employed. If the caller is involved, the interface 20 is actuated by the qualification unit 93 during the operating interval t1 to instruct the caller: "Please key in your telephone calling number". As indicated above, an alternative involves the system simply registering the calling number on the basis of its provision by ANI equipment.

In any event, after the caller's telephone number is registered, the instruction is given: "Participation in instant winner lottery is for persons over twenty-one years of age. Accordingly, please key in the year of your birth". A driver's license or credit card number may be similarly registered to confirm age. Alternatively, the combination of telephone number and date of birth could be used. In any event, the caller's data is registered and the qualification unit 93 then functions to test the data as provided. Specifically, the caller's telephone number is checked in a look-up table 99 to determine whether or not it is a proper and currently valid number for use in the lottery. Concurrently, the number is checked by the use-rate calculator to determine the number of times it has been used in excess of a predetermined number of calls or dollar value to participate in the lottery during a current interval of monitoring.

If the data indicates a qualified caller, the system proceeds to the next phase of designating the transaction. Note that the sequence is not significant in this operating format with the consequence that the interval t2 and the operation of the sequencer 94 may be bypassed. Rather, the designation unit 96 operates during the interval t3 to provide the caller with a designation for the current transaction and if applicable, updates the file as to current use or dollar value remaining for the caller's use. As explained above, the random generator 101 with or without the encryptor 102 may be employed to create an identification number which may

5,684,863

13

include an encrypted form of the caller's telephone number. Accordingly, data for the transaction is established in the buffer 97 then set in a cell of the memory 98 (FIG. 4). Specifically, the completed data cell format might be as follows: Telephone No.-Birth Year-Designation-Random No.

The system next functions to generate the random number as indicated above which will then be tested against a series of other numbers to determine whether or not the caller is a winner. In that regard, elements in the processing unit 92 which accomplish the operation are illustrated in FIG. 6 which will now be considered in detail.

A random number generator 160 functions on command to provide a three-digit number. With the consummation of a call, the random number generator 160 is actuated to provide the caller's random number in a selected caller cell 162. From that location, the caller's random number is compared with numbers from a register 164 by a comparator 166. The numbers in the register 164 were previously passed through a gate 174 from the generator 160. In the event of coincidence, the comparator provides an output "yes" signal to a line 168. Conversely, the failure of coincidence prompts the comparator 166 to provide a "no" output to a line 170. Essentially, a "yes" indicates a win while a "no" indicates the caller has lost.

The elements of FIG. 6 provide a random operating format to determine winners on a somewhat statistical basis; however, the system increases the probability with the passage of time when no win occurs. In that regard, at the outset of an operating cycle, the random number generator 160 provides a random number that is passed through the gate 174 to the register 164. In the exemplary format, a three-digit number would be provided. At that stage, the caller's random number, from the cell 162, would be compared with the single number in the register 164 by the comparator 166. However, with the passage of time, calls are tallied or time is metered by a counter 178. Accordingly, upon the attainment of a predetermined count, the gate 174 is again qualified to enter another number in the register 164. Accordingly, an increasing set of numbers are held in the register 164 for comparison with each caller's number. Of course, the more numbers in the register 164, the higher probability of a caller winning and that relationship depends upon the duration or number of calls since the last winner.

Either a win or a loss as indicated within the processing unit 92 (FIG. 4) prompts the interface 20 to respond appropriately to the caller announcing his results. If there is a win, the designation may be reinforced and additional identification may be taken as explained above. Of course, if the prize simply involves a credit on the caller's telephone bill or his credit account, identification and designation become less critical considerations.

In the event of substantial awards to be claimed, the processing system P1 (FIG. 1) may actuate the printer PR to produce a positive identification of the winner, which document may be redeemed only by the caller providing the assigned designation along with confirmation of his identification data.

Generally in relation to awards, the processing unit 92 may also utilize a random number format for determining the significance of awards. That is, a random number may be actuated to provide numerals from one through twenty, for example, the magnitude of the number generated for a caller indicating the significance of his award. Normally such information would be provided to the caller and registered in his memory cell.

14

With respect to memory cells generally, it is to be noted that actuated memory cells may be cleared for callers who are not winners. Accordingly, a limited number of memory cells store the subset of winners for subsequent confirmation processing and so on.

As another operating process format in accordance with the present invention, consider an auction sale. As disclosed herein, the auction format is associated with television as, for example, in the form of a cable channel for dedicated use during an interval of an auction sale.

Preliminarily, in accordance with the disclosed exemplary format, persons wishing to participate in the auction sale would make preliminary arrangements involving utilization of the system to establish authorization data for qualified bidders in cells C1-Cn of the memory 98 (FIG. 4). In an alternative format, the bidders could simply be qualified immediately before bidding, as on the basis of a charge-card number or other identification.

Generally, it is contemplated that callers are coupled into the system only during the bidding on specific items of merchandise. Accordingly, some prequalification may be desirable to facilitate the rapid accumulation of a bidding group with the introduction of a unit of merchandise.

In accordance with the disclosed format, an auctioneer conducts the sale in a somewhat traditional manner, recognizing that he is interfacing a relatively large audience through the system of the present invention and with a television connection. Specifically, the auctioneer is cued as to audience reaction by a monitor incorporated in the command computer terminal CT (FIG. 1). Essentially, the auctioneer is given an abstract or summary of the relative bidding as the auction progresses. In one format, the caller sees the auction on a television receiver. That is, the monitor may be covered by a television camera to inform the audience and particularly interested bidders. Consider the detailed steps of the operation.

As the auctioneer announces the next item for sale, it is televised to potentially interested bidders. In addition to being informed of the merchandise, potential bidders might also be reminded of the telephone number for participating in the auction. Accordingly, any interested person at a remote terminal T1-Tn may dial the auction number and obtain access to the processing systems P1-Pn. The caller would have a television set available, tuned for example to a cable channel.

Any preliminary qualification as indicated above will then be performed along with any appropriate designation. With regard to the designation, unless callers are identified as part of the qualification step, the designation unit 96 (FIG. 4) assigns a limited-digit number to individual callers for use by the auctioneer interfacing the command computer and terminal CT. Further designation and sequencing as disclosed herein also constitute part of the process. To the extent that qualification and designation operations may be performed, the operations are performed as described above with reference to FIG. 4 by the qualification unit 93 and the designation unit 96. Of course, any of the safeguards and limitations as described herein may be employed as deemed appropriate for an auction format.

After the preliminaries, the auctioneer initiates the bidding with respect to a particular item that is observed by the callers on a television receiver as through a cable channel. Note that the audio may be variously-coordinated through the telephone communication facility C and the audio channel of the caller's television. In a simple format, after an introductory phase, communication to callers with respect to

5,684,863

15

the bidding is provided through the television link. Alternatively, the audio unit AD (FIG. 1) may be employed.

Essentially, the auctioneer initiates the bidding by stating an initial value for the opening bid. Callers are invited to bid by actuating the push buttons 14 (FIG. 1). For example, the auctioneer may invite an initial bid of one hundred dollars asking callers to so bid by entering an asterisk (*) by punching the button so designated. In accordance with one operating format, cells in the memory 98 (FIG. 4) are actuated to register the bidding number in identified relationship with several calls. Note that although a record may be desirable, it is not usually necessary to record all bids, particularly at initial bidding figures. In any event, the individual processing units, e.g. unit 92 in individual processors PR1-PRn are interconnected (FIG. 1) and operate to select the final and key bids.

After attaining the initial bid, the auctioneer may invite further bidding by seeking a bid of two hundred dollars or any bid. Such a bid might be accomplished either by punching the asterisk button to attain the solicited bid, or by using number buttons to enter a different bid, e.g. two hundred fifty by buttons "2", "5" and "0". Again, cells of the memory 98 are actuated to record select bids (sequence) at the higher value.

The status of the bidding is presented to the auctioneer by the monitor of the command computer terminal CT (FIG. 1). Specifically, the auctioneer is provided an indication of the number of bidders at each level. If a sizeable number of callers bid at a specific value, the auctioneer may wish to advance the price significantly for the next round of bidding. Thus, the auctioneer proceeds until a small group of remaining callers are addressed. Note that the display of the command terminal CT (FIG. 1) may also inform the auctioneer of fresh bidders.

As the selection process proceeds, signals from the clock CL (FIG. 1) are introduced to indicate the sequence of bidders. For example, assume the bidding has proceeded to a stage where only three bidders remain active. The auctioneer is informed by the command terminal CT of the order in which the callers made their bids. The sequence is also of record in the cells of the memory 78 (FIG. 4) to indicate the sequence in the event that the final bid involves more than one caller. Of course, the first caller to respond with a bid would have priority in the purchase.

Normally at the conclusion of the bidding on a particular item, the contents of the cells in the memory 98 would be purged with only the final bidders being held in general memory within the processing unit 92. Of course, it is important to maintain a record of back-up bidders in the event the sale is not consummated with respect to the first of the highest bidders. That is, a subset of the highest bidders is preserved for each item of merchandise in the event that the highest bidder fails to qualify or the sale otherwise cannot be consummated. Of course, a distinct advantage of the system is the ability to accommodate a vast auction participation group for items of substantial value and as a consequence the distillation of a subset of callers is exceedingly valuable information.

To consider another operating format in association with the television media, a system will now be described whereby television viewers participate on a real-time basis in a game show for prizes. The ability to involve television viewers in a program has the potential of expanding program interest along with the expanded participation.

Game shows in accordance herewith may take any of a wide variety of forms as several well known programs in

16

which studio contestants compete for prizes. In utilizing the system of the present invention to involve remote participants, it may be desirable to preliminarily qualify and designate callers as explained above. Specifically, prior to participating in an actual game show, interested participants interface the system as depicted in FIG. 1, and in the course of an exchange as described above, the qualification unit 93 and the designation unit 96 cooperate with the processing unit 92 to accomplish preliminary data on potential participants in cells of the memory 96.

Various games will involve different screening processes and clearances. For example, a child's television game format may require parental clearance and in that regard written communication may be required for approvals. Such approval may require the assignment of a personal identification number to the child player as qualifying identification data.

As explained above, clearances may be perfected through the look-up table 99 (FIG. 4) in association with the qualification unit 93 or approvals through a consumable key step may be extended to incorporate functions of the processing unit 92 in association with the memory 98. For example, if qualification simply involves a check-off operation, the look-up table 99 will normally be employed. However, in the case of preregistration for a participant, as in the case of the auction sale, the memory 98 is involved with the qualification unit 93 through the processing unit 92 to establish a data cell C1-CN for each qualified participant. Thus, each potential participant to be qualified interfaces with the processing unit 92 during a preliminary interval of operation to provide data in one of the cells C1-CN to facilitate qualification for participation during a real-time game show.

At the time of the show, callers are qualified simply by reference to their assigned memory cell data for a verification. Thereafter, the caller's exchange information to supplement their data as with respect to the play which follows. Specifically for example, a caller might select a studio audience participant with whom the caller is to be allied. The interface operation may be essentially as described above wherein a voice generator in the interface 20 (FIG. 1) provides signals which activate the remote telephone unit to speak the instruction: "If you wish to play with Player No. 1, please push button No. 1; if you wish to play with Player No. 2, please push button No. 2 . . . and so on". The caller may also be instructed to indicate the extent of a wager. For example, "Push the number button indicating the points you wish to risk".

The participant data is stored in an assigned cell of the memory 98 (FIG. 4) for the caller and as the game proceeds, the processing unit 92 tallies the caller's score. Scores are interrelated between individual processing units to actuate the terminal CT. Thus, individual accounting occurs for each of the calling participants on an on-line basis dependent upon the success of the studio players and their association with the callers. On-going accounting data may be provided at intervals or real time by the recorded voice to each contestant.

According to the described format, after an interval of play, the processing units, as the unit 92 (FIG. 4), operate to isolate a subset of caller-players who have amassed the highest scores. Of course, various arrangements may be provided for awarding prizes to the select subset of winning callers.

The above format involves a real-time game show with an on-line operating format. A somewhat similar format

5,684,863

17

involves nonreal-time operation and in that sense, callers may interface with the system of the present invention before and after the show; however, not primarily during the show. Such a show might involve a quiz for callers based on their ability to perceive and remember occurrences within the show. Preregistration may be employed, however, is not essential. Rather, callers may call after the broadcast of a program. In that event, sequence or time clocking may be very important to limit or control individual interfaces to a specific time or geographic "window". That is, as suggested above, allocation-routing equipment and techniques may be employed in various of the formats to window callers. With the system, callers are screened or qualified at the time of a call, identified in a particular calling sequence, designated for identification and quiz answers are given for subsequent processing. Alternatively, players could participate by providing their credit card for billing or be billed through the "pay-to-dial" network. Consider an exemplary format.

A key to participation in the game show may involve the purchase of a particular product. For example, a person desiring to participate may purchase a product which carries a concealed key number. The number serves as a caller's key to participation in the game show.

In accordance with the disclosed operating format, after watching the broadcast of a television show (possibly a serial episode) the participant actuates the push buttons 14 at one of the remote terminals T1-Tn to accomplish an interface communication with the select operating format. For example, the caller may actuate the buttons 14 for the station number "277-7777" which identifies the game format of current description.

Assume responsive operation of the communication facility C to couple the caller through the automatic call distributor AC1 to the interface 20. Upon establishing a connection, the interface 20 receives the caller's telephone number through ANI equipment and a data cell in the memory 98 (FIG. 4) is assigned to the caller. Specifically, for example, associative coupling is provided for the caller through the switch 21 (FIG. 1) to the processor PR1 containing the memory 98 (FIG. 4) and a cell C2 assigned to the caller. A block format 200 is illustrated in FIG. 7 indicating the data that is developed in the cell C2. At the outset, the caller's telephone number is stored in a section 201 followed by uses/month in section 202.

Next, the caller is greeted and requested to give the key number entitling him to participate in the game show. The instruction constitutes an initial action to take place in an interval of qualification during the time t1. The caller actuates the buttons 14 providing digital representations to the qualification unit 93 (FIG. 4) and the look-up table 99 is consulted. Note that the table 99 may be a large, shared unit that tabulates each of the key numbers and accounts for their use. If the caller has identified a proper key number, the process proceeds and the key number is accounted, i.e., incremented or decremented to the limit of use if any. Alternatively, a repeat information operation may be requested as described in detail above.

As a further check during the qualification stage, the use-rate calculator 100 may function to determine whether or not an excessive number of calls have originated from the designated number. Thus, consideration involves calls or value with reference to a predetermined period of time. Again, a shared calculator may be used or addressing may obtain selectivity on the basis of calling numbers. If a large number of calls have originated from a single telephone terminal, a fraudulent situation may be suggested. Assuming

18

no such indication occurs, the number of uses is registered in a section 200 (FIG. 7) and the operation proceeds from the interval t1 to interval t2.

During the interval t2, the sequencer 94 registers the precise time of the call in the buffer storage 97, specifically in a section 204 as illustrated in FIG. 7. With the entry of such data, the system passes from the operating interval t2 to t3.

The caller is next asked to identify himself in some specific manner. For example, the caller may simply be asked to provide the year of his birth. Alternatively, somewhat Comprehensive information may be taken as in the form of drivers' license numbers, social security numbers and so on. Of course, such data may be employed for subsequent identification of the caller and, accordingly, is registered in the buffer storage 97 (FIG. 4). Specifically, identification information is registered in section 206 of the block 200 as shown in FIG. 7.

In addition to receiving identification information from a caller, the system assigns a designation to the caller. Specifically, the random number generator 101 (FIG. 4) provides a number which may be encrypted along with other identification data as the caller's personal identification to provide a numerical designation that is registered in the storage 97. Specifically, the designation is stored in a section 208 as illustrated in FIG. 7. With the designation operation complete, the interval t3 terminates initiating the data accumulation phase which occurs during an operating interval t4.

At this juncture, operating elements within the processing unit 92 will be considered in relation to an explanation of the manner in which select questions are provided to a caller and his answers received and recorded for subsequent processing to determine winners.

Preliminarily, reference will be made to FIG. 8 showing elements involved in the operating format which are contained in the processing unit 92 (FIG. 4) in association with the memory 98. To avoid confusion, the elements identified in FIG. 8 are designated by fresh numerals.

To accommodate the exemplary operating format, a dramatic program might be recorded preparatory to the television broadcast. A substantial number of questions would then be formulated based on the dramatic program. For example, "How many people were present when the will was read?"

It is contemplated that the dramatic program would be broadcast to different geographical segments of the country during different time intervals. To accommodate the different time intervals, it is proposed to utilize different questions for each geographic segment. That is, the basic format can remain the same, only the questions change by time zone to avoid study and collaboration on questions as a result of time shifts. A question propounded to a Chicago caller should not be repeated to a Los Angeles caller. In any event, callers might be given three questions randomly drawn from a pool serving one geographic segment and three questions drawn from a different pool serving another geographic segment.

The signals for prompting a voice generator are registered in memory sections MS1 through MSn. Each of the memory sections MS1-MSn is served by an address input AII-AIn respectively. Similarly, the address inputs AII-AIn are instructed by random number generators NG1-NGn, in turn actuated by decoders DE1-DEn. Consider the operating sequence of the memory MS1 as an example.

The decoder DE1 is responsive to telephone calling numbers (provided by ANI equipment) indicative of a particular geographic area. Note, for example, that area code

5,684,863

19

numbers afford an effective geographic classification of callers which is very useful in many formats or processes of statistical analysis in accordance herewith. Note that geographic (or other) classification in accordance herewith is also accomplished by the called numbers provided. Each of several television stations would solicit calls for different numbers as a result, either by DNIS or call channeling. Select processors would be reached through the interface units, e.g. interface 20 FIG. 1. In operation, the decoder DE1 determines a call is from a specific geographic area and accordingly provides a signal to actuate the random number generator NG1. As a consequence, the random number generator NG1 provides a series of three random numbers in the form of addresses for the memory MS1. That is, the addresses may simply comprise three alphanumeric bits supplied to the address input A11 to prompt the provision of three sets of voice generator signals for announcing the three questions in sequence. For example, the first question might be as suggested above: "Push the button on your telephone for the number of persons present in the room when the will was read".

The voice generator signals are supplied from the memory MS1 (within the processing unit 92, FIG. 4) to the interface 20 (FIG. 1) which generates audio signals to actuate the caller's hand piece 10. Accordingly, the caller is instructed to answer three questions, the responses being recorded in a section 210 of the data block 200 (FIG. 7). Note that the clock 105 (FIG. 4) may be utilized to limit the response period allowed each caller.

As indicated above, to accommodate broadcast of the program in a different time slot for a different geographic area, the decoder DEN (FIG. 8) actuates the random number generator NGn to address the memory MSn to provide three different questions as a result of a random selection. Accordingly, within a time or times (perhaps limited and offset) after the conclusion of the program, a substantial number of callers are accounted for in cells of the memory 98 and similar units of the composite system. The cells indicate sequences of calling and also may contain billing data where appropriate. That is, pay-to-dial operations avoid the need for billing, yet it may still be made of record.

Subsequent to the data accumulation phase of operation, the processing unit 92 (and its equivalents) is actuated during an off-line processing interval to isolate the subset of callers correctly responding to the questions. In accordance with one format, the subset of successful callers may be reduced to a sub-subset as by a random computer "draw" to define a group of significant winners. That is, a random number generator may be employed as explained above.

As an alternative to subsequent processing, the system may inform callers of their success during the course of the interface telephone call. That is, callers might simply be informed by cuing the voice generator: "Your answers are correct and in accordance with the program game, you will now be entered in the sweepstakes draw for the prize" Thus, the format defines a subset then further selects a sub-subset of winners. In any of the various formats, the status of the analysis can be televised by selecting a camera focused on the interface terminal IT.

Still another operating format for the system takes the form of polling operations to determine opinion or facts. An illustrative form of the format is disclosed below again in association with a television broadcast.

Generally, the illustrative polling format is contemplated in association with a television broadcast addressing a matter of current interest as, for example, a political issue or

20

election. A master of ceremonies propounds questions to a viewing audience, many of whom are on-line through an interface of a system of the present invention. The master of ceremonies or commentator instructs the callers who are regulated and controlled by the system of the present invention to provide digital data which the system processes to inform the commentator as with regard to subsets of callers. For example, the commentator may be statistically informed as to the numbers of callers holding specific views. Consider a specific exemplary operating format.

Assume the existence of a system in accordance with the present invention installed for use in association with a television broadcasting facility. Of course, various previous arrangements could be involved; however, according to one arrangement a commentator simply invites members of the viewing audience to call a specific number and express their views with respect to a specific issue. Callers located at terminals T1-Tn (FIG. 1) activate the terminals to accomplish an interface with one of the processing systems P1-Pn as explained above. Note that the processor (or the interface 20) may involve operation of the qualification unit 93 (FIG. 4) to prevent callers from loading the poll. That is, to prevent multiple calls from a single terminal that would distort a poll, the qualification unit 93 registers calls in association with the use-rate calculator 100. Interfacing a specific processor, callers are screened by the qualification unit 93 (FIG. 4). In such a poll, it may be important to control the sampling group on a statistical basis. For example, it may be desirable to limit callers from each of several geographic areas. Accordingly, by the use of ANI equipment, the caller's telephone number is provided to the qualification unit 93 during the preliminary interval t1, and a determination is performed with regard to the number of involved callers from the geographic area using the look-up table 99. On attaining a full quota from a specific area, a subsequent caller may be informed that the lines are full. Alternatively, the caller may be requested to provide his telephone number for screening in the event ANI equipment is not available.

The caller may be requested to provide additional information so as to poll a balanced group. For example, a caller might be asked questions concerning age, political registration and so on by prompting the interface unit 20 to pose audio questions and testing the digital results through the qualification unit 93 as with reference to the look-up table 99.

As indicated above, in the event that the broadcast television program is one of a series, it may be desirable to limit the extent of participation over a period of several programs. Accordingly, the use-rate calculator 100 (FIG. 4) may be employed in association with the qualification unit 93. That is, if a calling number has participated in a prior poll, it may be denied access for a subsequent poll or its data not counted. Such operation would involve the use-rate calculator 100 in association with the qualification unit 93 performing logic tests to actuate the voice generator of the interface 20 for providing an appropriate interchange with a caller.

With the screening or qualification of a select group of callers, the sequencer 94 (FIG. 4) may or may not be involved to identify the order of callers. Also, the designation unit 96 may or may not be involved in view of the fact that for many polls there is little interest in subsequently identifying callers.

In the poll-format operation of the system, it is important to provide a capability of defining select intervals during which callers may provide data. In one arrangement, with

5,684,863

21

the consummation of a communication interface between a caller and a processor unit, the audio of the television broadcast is keyed from the audio unit AD through the switch 21 (FIG. 1) for communication to the caller.

With a multiplicity of callers in interface relationship with the processors PR1-PRn as function units, a polling question is stated, for example: "If you favor expanded trade with . . . at the tone press button one; if you do not, press button two".

To control the interval of polling, the command computer terminal CT (FIG. 1) is actuated to enable the callers timely access to the processors.

At the expiration of a polling interval, the interfaces may be terminated or additional questions may be propounded. In any event, subsequent to the data-gathering phase, the bulk data is supplied to the command computer terminal CT incorporating computing facility to isolate subsets for communication by the broadcast. Accordingly, an effective on-line poll can be conducted with statistical sampling control and prompt display of responses.

As explained above, the arrangement of the function unit (or units) may be variously embodied in a single processor or many processors, depending on various considerations as time sharing, multiplexing, paralleling and so on. The systems as described above embody the components bulked together in one location. However, components of the system could be spaced apart geographically, using dedicated lines or polling techniques. An illustrative embodiment is shown in FIG. 9.

Call distributors CD1-CDn are at different geographic locations along with associated interface units IA1-IAm and IB1-IBn. Each of the interface units, as unit IA1 is coupled to a central processor 251 as indicated by lines 252, 254, 256 and 258. Each of the lines may take the form of a dedicated telephone line or a polling telephonic coupling.

In the operation of the system of FIG. 9, the call distributors CD are coupled to a telephonic communication system and accordingly allow the interface units I to provide interface communication between the central processing unit 251 and a multitude of remote terminals T1-Tn as illustrated in FIG. 1. With data accumulated in the cells, it may be variously down loaded as to a central processing station. Thus, the distributed-component system is capable of executing the various formats as explained above with reference to the illustrative structure.

In view of the above explanation of exemplary systems, it will be appreciated that other embodiments of the present invention may be employed in many applications to accumulate statistical data, process such data, and define subsets of callers of concern. While certain exemplary operations have been stated herein, and certain detailed structures have been disclosed, the appropriate scope hereof is deemed to be in accordance with the claims as set forth below.

What is claimed is:

1. A process for controlling operations of an interface with a communication facility, said process including the steps of: providing products carrying participation numbers specifying limits on use to entitle individual callers to access said operations of said interface with said communication facility; coupling remote terminals to said interface for providing voice signals to said individual callers as to provide vocal operating instructions to said individual callers; receiving digital identification data from said individual callers responsive to said voice signals including said

22

participation numbers for said individual callers and answer data provided from said remote terminals under control of said individual callers;

qualifying said individual callers by testing to determine if said individual callers are entitled to access said operations of the interface based on said limits on use specified by said participation numbers for said individual callers and accordingly providing approval signals for qualified individual callers;

accessing a memory with said participation numbers for said individual callers and storing data relating to calls from said individual callers; and

processing at least certain of said answer data responsive to said approval signals to isolate a subset of said individual callers.

2. A process according to claim 1, wherein a limit on use with respect to each of said individual callers specifies a predetermined number of uses.

3. A process according to claim 1, wherein a limit on use with respect to each of said individual callers specifies a predetermined dollar amount.

4. A process according to claim 1, wherein said communication facility automatically provides called terminal digital data (DNIS) to identify a specific format from a plurality of formats for executing operations of said interface.

5. A process according to claim 4, wherein said communication facility also automatically provides calling terminal digital data to identify said remote terminals.

6. A process according to claim 5, wherein said calling terminal digital data is stored in said memory.

7. A process according to claim 6, wherein said calling terminal digital data is tested to control access to said operations of the interface.

8. An analysis control system for use with a communication facility including remote terminals for individual callers, wherein said remote terminals may comprise a conventional telephone instrument including voice communication means, and digital input means in the form of an array of alphabetic numeric buttons for providing data, said analysis control system comprising:

an interface structure coupled to said communication facility to interface said remote terminals for voice and digital communication, and including means to provide caller data signals representative of data relating to said individual callers developed by said remote terminals and means to receive calling terminal digital data automatically provided by said communication facility; voice generator structure coupled through said interface structure for actuating said remote terminals as to provide vocal operating instructions to said individual callers;

record structure, including memory and control means, said record structure connected to receive said caller data signals from said interface structure for accessing a file and storing digital data relating to said individual callers provided from said digital input means through said interface structure to store designations of said individual callers including representations indicative of a calling order sequence of said individual callers, said record structure also including a database of stored calling terminal digital data; and

qualification structure controlled by said record structure for restricting the extent of access to said system by said individual callers based on a comparison of said calling terminal digital data against said database of stored calling terminal digital data.

5,684,863

23

9. An analysis control system according to claim 8, wherein said individual callers provide personal identification number data as caller data signals.

10. An analysis control system according to claim 8, wherein said calling order sequence is indicative of caller transaction data.

11. An analysis control system for use with a communication facility including remote terminals for individual callers, wherein each of said remote terminals may comprise a conventional telephone instrument including voice communication means, and digital input means in the form of an array of alphabetic numeric buttons for providing data, said analysis control system comprising:

an interface structure coupled to said communication facility to interface each of said remote terminals for voice and digital communication, and including means to provide caller data signals representative of data relating to said individual callers developed by said remote terminals and including means to automatically receive calling terminal digital data from said communication facility;

voice generator structure coupled through said interface structure for actuating each of said remote terminals as to provide vocal operating instructions to each of said individual callers;

record structure, including memory and control means, said record structure connected to receive said caller data signals from said interface structure for accessing a file; and

designation structure coupled to said interface structure and said record structure for developing individual designations for at least certain of said individual callers, indicative of caller significance in order to isolate a subset of said individual callers at calling remote terminals.

12. An analysis system for use with a communication facility including remote terminal apparatus for individual callers, wherein said remote terminal apparatus may comprise a conventional telephone instrument including voice communication means, and digital input means in the form of an array of alphabetic numeric buttons for providing caller data including answer data, said analysis system comprising:

interface means selectively coupled to said communication facility to interface said remote terminal apparatus for voice and digital communication and including means to provide signals values from data developed by said remote terminal apparatus;

voice generator means selectively coupled through said interface means to said remote terminal apparatus for providing vocal operating instructions to said individual callers;

designation means selectively coupled to said interface means for assigning individual designations to said individual callers; and

processing means for processing at least certain of said answer data, and storage means for registering said answer data, said processing means for isolating a subset of said individual callers based on repeated comparisons of said answer data that is registered against said answer data being provided by said individual callers including data associated with said individual callers.

13. An analysis control system according to claim 12, wherein said designation means includes means for storing sequence data indicative of a calling sequence of said individual callers.

24

14. An analysis control system according to claim 12, wherein said voice generator means is driven to prompt certain select ones of said individual callers to provide telephone number data for storage.

15. An analysis control system according to claim 12, wherein said processing means processes said answer data that is registered in combination with said answer data being provided by said individual callers.

16. An analysis control system according to claim 12, further comprising:

transfer means for transferring certain of calls from said individual callers to a terminal attended by an operator.

17. An analysis control system according to claim 16, wherein said operator enters at least certain of said answer data for said certain of said individual callers.

18. An analysis control system according to claim 12, wherein said storage means stores caller provided digital data and voice data.

19. An analysis control system according to claim 12, wherein said answer data includes caller personal identifying data.

20. An analysis control system according to claim 19, wherein said repeated comparisons include processing of multiple personal identifying data including caller age data.

21. An analysis control system for use with a communication facility including remote terminals for individual callers, wherein each of said remote terminals may comprise a conventional telephone instrument including voice communication means and digital input means in the form of an array of alphabetic numeric buttons for providing data, said analysis control system comprising:

interface structure coupled to said communication facility to interface said remote terminals for voice and digital communication and including means to provide signals representative of data developed by said remote terminals and including means to automatically receive called number identification signals (DNIS) to identify one of a plurality of different called numbers;

voice generator structure coupled through said interface structure for actuating said remote terminals as to provide vocal operating instructions to specific ones of said individual callers;

record means, including memory and control means, said record structure connected to said interface structure for accessing a file and storing data relating to said individual callers;

designation means coupled to said interface structure and said record means for assigning individual designations to said individual callers and storing said designations in said record means as part of said data relating to said individual callers; and

encoding means coupled to said record means and said designation means for encoding at least certain of said data relating to said individual callers.

22. An analysis control system according to claim 21, wherein said designation means includes means for storing representations of other data provided by a caller including caller PIN number data.

23. An analysis control system according to claim 22, wherein said other data further includes caller credit card data.

24. An analysis control system according to claim 23, wherein said other data further includes credit card expiration data.

25. An analysis control system according to claim 23, wherein said caller credit card data is verified to approve said caller.

5,684,863

25

26. An analysis control system according to claim 21, wherein said record means includes means for storing customer number data which is tested to determine if said customer number data indicates negative or canceled status.

27. An analysis control system for use with a communication facility including remote terminals for individual callers, wherein said remote terminals may comprise a conventional telephone instrument including voice communication means, and digital input means in the form of an array of alphabetic numeric buttons for providing data, said analysis control system comprising:

interface structure coupled to said communication facility to interface said remote terminals for voice and digital communication, and including means to provide caller data signals representative of data relating to said individual callers developed by said remote terminals and including means to receive called number identification signals (DNIS) automatically provided by said communication facility to identify a select one of a plurality of different called numbers associated with a select format of a plurality of different formats;

record structure, including memory and control means, said record structure connected to receive said caller data signals from said interface structure for accessing a file and storing certain of said data developed by said remote terminals relating to certain select ones of said individual callers;

qualification structure coupled to said record structure for qualifying access by said individual callers to said select format based on at least two forms of distinct identification including caller customer number data and at least one other distinct identification data element consisting of personal identification data provided by a respective one of said individual callers; and

switching structure coupled to said interface structure for switching certain select ones of said individual callers at said remote terminals to any one of a plurality of live operators wherein said live operators can enter at least a portion of said caller data relating to said select ones of said individual callers through interface terminals, which is stored in said record structure.

28. An analysis control system according to claim 27, wherein said caller data signals include signals indicative of caller credit card number data provided by said individual callers.

29. An analysis control system according to claim 28, wherein said caller data signals further include signals indicative of credit card expiration date data.

30. An analysis control system according to claim 28, wherein said caller credit card number data is verified on-line.

31. An analysis control system according to claim 27, wherein said caller customer number data is tested to determine if caller status is unacceptable or cancelled.

32. An analysis control system according to claim 27, wherein said qualification structure qualifies said individual callers to provide access to at least a portion of said system.

33. An analysis control system according to claim 27, wherein said personal identification data is PIN number data.

34. An analysis control system according to claim 27, wherein at least one distinct identification is provided by said individual callers on-line and is stored in said record structure for subsequent use.

35. An analysis control system according to claim 32, wherein said access to at least a portion of said system is provided based upon a computer generated number identi-

26

fying a previous transaction, said computer generated number indicative of caller transaction order data.

36. An analysis control system according to claim 27, wherein said caller customer number data is calling number identification data automatically provided by said communication facility.

37. An analysis control system according to claim 27, wherein said qualification structure is further controlled by said record structure for testing at least certain of said caller data signals provided by said respective one of said individual callers to specify a consumable participation key for said respective one of said individual callers.

38. An analysis control system according to claim 37, wherein said consumable participation key is comprised of said at least two forms of distinct identification.

39. An analysis control system according to claim 27, wherein at least one of said at least two forms of distinct identification includes social security number data.

40. An analysis control system according to claim 27, wherein at least one of said at least two forms of distinct identification includes caller PIN number data.

41. An analysis control system according to claim 27, wherein at least one other distinct identification data comprises initials data.

42. An analysis control system according to claim 27, wherein said called number identification signals (DNIS) are received by one of a plurality of call distributors.

43. An analysis control system according to claim 42, wherein said plurality of call distributors are at different geographic locations.

44. An analysis control system according to claim 42, wherein said plurality of call distributors are accessed under control of call allocation routing capability of said communication facility.

45. A system according to claim 27, wherein said select format is one form of an order format.

46. A system according to claim 45, wherein said select order format is one form of a television initiated mail order operation.

47. A system according to claim 46, wherein said one form of said television initiated mail order operation further receives and stores at least a portion of calling number identification signals automatically provided by said communication facility.

48. An analysis control system according to claim 27, wherein an additional form of distinct identification is provided by said individual callers on-line and is stored for subsequent use.

49. An analysis control system according to claim 27, wherein said caller customer number is verified against a record of qualified customer numbers and said personal identification data is provided on-line by said individual callers and stored in said record structure for subsequent use.

50. A system according to claim 27, wherein said qualification structure further executes a test for unacceptable customer numbers based upon data developed by said remote terminals indicative of said caller customer numbers.

51. An analysis control system according to claim 27, further comprising:

means for providing computer generated number data indicative of sequence data to said individual callers.

52. An analysis control system according to claim 51, wherein said sequence data indicates caller transaction order data.

53. An analysis control system according to claim 51, wherein said personal identification data comprises caller social security number data.

5,684,863

27

54. An analysis control system according to claim 51, wherein said personal identification data comprises a PIN number.

55. An analysis control system according to claim 51, wherein said personal identification data comprises caller telephone number data.

56. An analysis control system according to claim 27, wherein said select format is identified by said one of said plurality of different called numbers and is a distinct operating process merchandising format for processing of a customer's interactive order.

57. An analysis control system according to claim 56, wherein said qualification structure tests credit for said individual caller.

58. An analysis control system according to claim 57, wherein said qualification structure testing for credit tests said caller customer number data for unacceptable or cancelled credit status.

59. An analysis control system according to claim 58, wherein said qualification structure testing for credit further test by scoring the instant transaction for credit approval.

60. An analysis control system according to claim 56, whereby said individual callers enter data indicative of the item for order.

61. An analysis control system according to claim 60, further comprising:

means for providing computer generated number data indicative of sequence data to said individual callers wherein said sequence data indicates caller transaction order data.

62. An analysis control system according to claim 61, wherein said personal identification data comprises social security number data.

63. An analysis control system according to claim 61, wherein said personal identification data comprises a PIN number.

64. An analysis control system according to claim 63, wherein said personal identification data element is provided on-line for said individual callers and is stored in said record structure for subsequent use.

65. An analysis control system for use with a communication facility including remote terminals for individual callers, wherein each of said remote terminals may comprise a conventional telephone instrument including voice communication means, and digital input means in the form of an array of alphabetic numeric buttons for providing data, said analysis control system comprising:

an interface structure coupled to said communication facility to interface said remote terminals for voice and digital communication, and including means to provide caller data signals representative of data relating to said individual callers developed by said remote terminals and including means to automatically receive called number identification signals (DNIS) to identify a select format from a plurality of formats;

voice generator structure coupled through said interface structure for actuating said remote terminals as to provide voice operating instructions to said individual callers;

record structure, including memory and control means, said record structure connected to receive said caller data signals from said interface structure for accessing a file and storing digital caller data relating to said individual callers provided from said digital input means through said interface structure; and

qualification structure for testing caller data signals provided by at least one of said individual callers to specify

28

a consumable participation key, said consumable participation key for use during a single predetermined period of time for restricting the extent of access to at least a portion of said system by said one of said individual callers on the basis of entitlement.

66. An analysis control system according to claim 65, wherein said caller data signals represent a plurality of data elements for identifying a caller or a caller transaction or both.

67. An analysis control system according to claim 66, wherein said consumable participation key is comprised of at least two forms of distinct identification.

68. A process for controlling operations of the interface with a telephonic communication system including remote terminals for individual callers, wherein each of said remote terminals may comprise a conventional telephone instrument including voice communication means and digital input means in the form of an array of alphabetic numeric buttons for providing data and wherein said telephonic communication system has a capability to automatically provide call data signals, indicative of calling number identification data or called number identification data (DNIS) or both, said process including the steps of:

providing products carrying concealed participation numbers specifying limits on use to entitle individual callers to access said operations of the interface with said telephonic communication system;

receiving said call data signals indicative of called number identification data including a called number (DNIS) dialed by a respective one of said individual callers to select a specific operating format from a plurality of operating formats of said operations of the interface;

coupling said remote terminals to said interface for providing voice signals to said individual callers and generating said voice signals for actuating said remote terminals as to provide vocal operating instructions to specific ones of said individual callers;

receiving digital identification data from said individual callers responsive to said voice signals including said participation numbers for said individual callers and answer data developed by said remote terminals under control of said individual callers;

qualifying said individual callers by testing to determine if said individual callers are entitled to access said operations of the interface based on said limits on use specified by said participation numbers for said individual callers and accordingly approving qualified individual callers;

conditionally accessing a memory with said participation numbers and storing data relating to calls from said individual callers;

processing at least certain of said answer data responsive to approving said qualified individual callers; and

providing on-going accounting data to said individual callers at intervals during calls from said individual callers.

69. A process according to claim 68, further including the step of:

updating said limits on use on-line.

70. A process according to claim 68, wherein said qualifying step further limits access by said individual callers to a predetermined period of time on the basis of entitlement.

71. A process according to claim 68, wherein said processing step further includes:

processing at least certain of said answer data provided to questions with respect to a poll.

5,684,863

29

72. A process according to claim 71, wherein said specific operating format is an automated promotional format associated with said specific operating format.

73. A process according to claim 72, wherein said participation numbers are provided in the packaging of said products.

74. A process according to claim 73, wherein said participation numbers are associated with an automated promotion of said products.

75. A process according to claim 74, wherein said participation numbers are concealed within said products.

76. A process according to claim 68, further comprising the step of:

allocating calls from said individual callers through said communication facility to window callers.

77. A process according to claim 68, further comprising the step of:

receiving said call data signals indicative of calling number identification data with respect to all or nearly all of said individual callers.

78. A process according to claim 77, wherein at least a part of said calling number identification data is utilized in said processing step to test for excess use with respect to said specific operating format.

79. A process for controlling operations of an interface with a telephonic communication system including remote terminals for individual callers, wherein each of said remote terminals may comprise a conventional telephone instrument including voice communication means and digital input means in the form of an array of alphabetic numeric buttons for providing data and wherein said telephonic communication system has a capability to automatically provide call data signals indicative of calling number identification data or called number identification data (DNIS) or both, said process including the steps of:

providing products carrying concealed participation numbers specifying limits on use to entitle said individual callers to access said operations of the interface with said telephonic communication system;

receiving said call data signals indicative of called number identification data including a called number (DNIS) dialed by individual callers to select a specific operating format from a plurality of operating formats of said operations of the interface;

coupling remote terminals to said interface for providing voice signals to said individual callers and generating said voice signals for actuating said remote terminals as to provide vocal operating instructions to specific ones of said individual callers;

receiving digital identification data from said individual callers responsive to said voice signals including said participation numbers and answer data provided from said remote terminals under control of said individual callers;

qualifying said individual callers by testing to determine if said individual callers are entitled to access said operations of the interface based on said limits on use specified by said participation numbers and accordingly approving qualified individual callers;

conditionally aborting interaction during said operations of the interface with an individual caller at an remote terminal and coupling said remote terminal to an interface terminal under predetermined conditions for direct personal communication;

accessing a memory with said participation numbers and storing data relating to calls from said individual callers; and

30

processing at least certain of said answer data responsive to approving said qualified individual callers.

80. A process according to claim 79, further comprising the step of:

providing on-going accounting data to said individual callers at intervals during calls from said individual callers.

81. A process according to claim 79, further including the step of:

updating said limits on use on-line.

82. A process according to claim 79, wherein said step of receiving said call data signals includes receiving said called number identification data to identify one form of an automated promotional format associated with said products as said specific operating format.

83. A process according to claim 79, wherein said step of qualifying based upon said limits on use takes place on-line.

84. A process according to claim 79, wherein said processing step further includes:

processing at least certain of said answer data provided to questions with respect to a poll.

85. A process according to claim 79, wherein said participation numbers are provided in the packaging of said products.

86. A process according to claim 85, wherein said participation numbers are associated with an automated promotion of said products.

87. A process for controlling operations of the interface with a telephone communication system, said process including the steps of:

providing products carrying participation numbers concealed within the packaging of said products, said participation numbers specifying limits on use to entitle individual callers to access said operations of the interface with said telephone communication system;

coupling remote terminals to said interface for providing voice signals to said individual callers and generating said voice signals for actuating said remote terminals as to provide vocal operating instructions to specific ones of said individual callers;

receiving digital identification data from said individual callers responsive to said voice signals including said participation numbers for said individual callers and answer data provided from said remote terminals under control of said individual callers;

qualifying said individual callers by testing to determine if said individual callers are entitled to access said operations of the interface based on said limits on use specified by said participation numbers for said individual callers and accordingly approving qualified individual callers;

accessing a memory with said participation numbers for said individual callers and storing data relating to calls from said individual callers;

processing at least certain of said answer data responsive to approving said qualified individual callers; and

receiving calling number identification signals from said telephone communication system for said individual callers and utilizing at least part of said calling number identification signals in said processing step.

88. A process according to claim 87, further including the step of:

updating said limits on use on-line.

89. A process according to claim 87, wherein said process is for automating a promotion.

5,684,863

31

90. A process according to claim 87, wherein said step of qualifying further restricts the extent of access during a predetermined period of time to at least a portion of said system on the basis of entitlement.

91. A process according to claim 87, wherein said processing step further includes:

processing at least certain of said answer data provided to questions with respect to a poll.

92. An process according to claim 87, wherein said participation numbers are associated with an automated promotion of said products.

93. An analysis control system for use with a communication facility including remote terminals for individual callers, wherein each of said remote terminals may comprise a conventional telephone instrument including voice communication means and digital input means in the form of an array of alphabetic numeric buttons for providing data and wherein said communication facility has a capability to provide call data signals indicative of calling number identification data and called number identification data for at least certain of said individual callers, said analysis control system comprising:

interface structure coupled to said communication facility to interface each of said remote terminals for voice and digital communication, and including means to provide signals representative of data developed by said remote terminals and for receiving said calling number identification data and said called number identification data (DNIS) to identify one from a plurality of called numbers;

voice generator structure coupled through said interface structure for actuating said remote terminals as to provide vocal operating instructions to said individual callers;

record structure, including memory and control means, said record structure connected to said interface structure for accessing a file and storing data relating to certain select ones of said individual callers in accordance with said calling number identification data;

qualification structure controlled by said record structure for controlling access to said system by said individual callers; and

means for processing at least certain of said data developed by said remote terminals relating to certain select ones of said individual callers.

94. An analysis control system according to claim 93, further comprising:

a plurality of call distributors located at different geographic locations wherein called number identification signals (DNIS) to identify said plurality of called numbers are received at said interface structure through said plurality of call distributors and wherein said communication facility further comprises:

call allocation routing capability to window said individual callers.

95. An analysis control system according to claim 94, wherein said one from a plurality of called numbers corresponds to a select one of a plurality of formats.

96. An analysis control system for use with a communication facility including remote terminals for individual callers, wherein each of said remote terminals may comprise a conventional telephone instrument including voice communication means, and digital input means in the form of an array of alphabetic numeric buttons for providing data, said analysis control system comprising:

an interface structure coupled to said communication facility to interface said remote terminals for voice and

32

digital communication, and including means to receive answer data signals provided by said individual callers from said remote terminals wherein said communication facility automatically provides called number identification data signals indicating a called number (DNIS) dialed by an individual caller and said called number is one of a plurality of called numbers;

voice generator structure coupled through said interface structure for actuating said remote terminals as to provide vocal operating instructions to said individual callers;

record structure including memory and control means for storing answer data signals and for receiving identification data signals for specific of said individual callers, said record structure further including means for receiving additional identification data signals on-line for said specific of said individual callers and for storing said additional identification data signals in said record structure for subsequent identification of said individual callers;

means for processing at least certain of said answer data signals relating to select ones of said individual callers; and

qualification structure for verifying said identification data signals for specific of said individual callers against a file of stored identification data.

97. An analysis control system according to claim 96, wherein calling number identification signals automatically provided by said communication facility are received and processed by said system.

98. An analysis control system according to claim 96, wherein said identification data signals comprise caller customer number data.

99. An analysis control system according to claim 98, wherein said additional identification data signals comprise at least one of caller PIN number data, caller initials data, social security number data, or caller telephone number data.

100. An analysis control system according to claim 98, wherein calling number identification data automatically provided by said communication facility is indicative of said caller customer number data.

101. An analysis control system, according to claim 96, wherein said identification data signals include data indicative of caller customer number data and said additional data signals are indicative of caller social security number data.

102. An analysis control system, according to claim 100, wherein said additional identification data signals are indicative of caller PIN number data.

103. An analysis control system according to claim 101, further comprising:

a plurality of call distributors located at different geographic locations wherein called number identification signals (DNIS) to indicate said plurality of said called numbers are received at said interface structure through said plurality of call distributors and wherein said communication facility further comprises:

call allocation routing capability to window said individual callers.

104. An analysis control system according to claim 96, further comprising:

means for providing computer generated number data indicative of caller transaction sequence data and storing said computer generated number data in said record structure.

105. An analysis control system according to claim 104, wherein said computer generated number data is provided in

5,684,863

33

a chronological order to said individual callers during a data acquisition phase.

106. An analysis control system according to claim 96, wherein said one of a plurality of called numbers identifies one of a plurality of distinct operating formats.

107. An analysis control system according to claim 106, further comprising:

qualification structure to test said individual callers on the basis of limits specified on use.

108. An analysis control system according to claim 106, wherein a select one of said plurality of distinct operating formats is an automated ordering format.

109. An analysis control system for use with a communication facility including remote terminals for individual callers, wherein each of said remote terminals may comprise a conventional telephone instrument including voice communication means and digital input means in the form of an array of alphabetic numeric buttons for providing data, said analysis control system comprising:

interface structure coupled to said communication facility to interface said remote terminals for voice and digital communication and including means to provide signals representative of data developed by said remote terminals;

voice generator structure selectively coupled through said interface structure to said remote terminals for providing vocal operating instructions to individual ones of said individual callers;

record memory connected to said interface structure for accessing a file and storing data relating to certain select ones of said individual callers including voice data and digital data developed by said remote terminals;

qualification structure for qualifying said individual callers by testing to determine if at least certain of said individual callers are entitled to access a processing format of said analysis control system;

structure selectively coupled to said interface structure and said record memory for providing computer generated numbers to said individual callers and storing said computer generated numbers in said record memory; and

analysis structure connected to said record memory for processing at least certain of said data relating to certain select ones of said individual callers; and

means to control processing formats of said analysis control system in accordance with signals automatically provided by said communication facility indicative of a respective one of a plurality of called numbers (DNIS) for a respective one of said processing formats.

110. An analysis control system according to claim 109, wherein said signals representative of data include credit card or participation number data.

111. An analysis control system according to claim 110, wherein said credit card or participation number data is verified.

112. An analysis control system according to claim 109, wherein one of said plurality of called numbers (DNIS) is a pay to dial number.

113. An analysis control system according to claim 109, wherein one form of a select processing format polls certain individual callers for personal information data.

114. An analysis control system according to claim 113, wherein said personal information data includes physical characteristic data.

115. An analysis control system according to claim 113, wherein said personal information data includes age data.

34

116. An analysis control system for use with a communication facility including remote terminals for individual callers, wherein each of said remote terminals may comprise a conventional telephone instrument including voice communication means and digital input means in the form of an array of alphabetic numeric buttons for providing data and wherein said communication facility has a capability to provide called number identification data (DNIS) and calling number identification data, said analysis control system comprising:

multiple automatic call distributors at geographically distinct locations for receiving calls from said individual callers at said remote terminals;

interface structure coupled to said communication facility to interface said remote terminals for voice and digital communication and including means to receive caller data signals representative of data relating to said individual callers, including caller personal identification data and said called number identification data signals (DNIS) and said calling number identification data provided automatically by said communication facility, said called number identification data signals (DNIS) identifying a select format from a plurality of formats;

voice generator structure coupled through said interface structure for actuating said remote terminals as to provide vocal operating instructions in accordance with said select format to said individual callers and to prompt said individual callers to enter data;

record testing structure connected to receive and test said caller data signals including said calling number identification data and said caller personal identification data against previously stored calling number identification data and caller personal identification data; and analysis structure for receiving and processing said caller data signals under control of said record testing structure.

117. An analysis control system according to claim 116, wherein said communication facility further comprises:

call allocation routing capability to window said individual callers.

118. A process for controlling operations of an interface with a telephonic communication system including remote terminals for individual callers, wherein each of said remote terminals may comprise a conventional telephone instrument including voice communication means and digital input means in the form of an array of alphabetic numeric buttons for providing data and wherein said telephonic communication system has a capability to automatically provide call data signals indicative of calling number identification data or called number identification data (DNIS) or both, said process including the steps of:

providing products carrying participation numbers concealed within said products specifying limits on use relating to a dollar amount to entitle said individual callers to access said operations of said interface with said telephonic communication system;

receiving said call data signals indicative of called number identification data including a called number (DNIS) dialed by said individual callers to select a specific operating format from a plurality of operating formats of said operations of said interface wherein at least one of said plurality of operating formats includes an automated promotional format for promoting said products;

coupling said remote terminals to said interface for providing voice signals to said individual callers and

5,684,863

35

generating said voice signals for actuating said remote terminals as to provide vocal operating instructions to specific ones of said individual callers;

receiving digital identification data from said individual callers responsive to said voice signals including said participation numbers and answer data provided from said remote terminals under control of said individual callers;

qualifying said individual callers by testing to determine if said individual callers are entitled to access said operations of said interface based on said limits on use specified by said participation numbers and accordingly approving qualified individual callers;

accessing a memory with said participation numbers and storing data relating to calls from said individual callers;

processing at least certain of said answer data responsive to approving said qualified individual callers; and

providing on-going accounting data to said individual callers, said on-going accounting data for at least one of a plurality of intervals being determined at least in part by said answer data provided by an individual caller during a call and during at least one of said intervals includes real time data provided to said individual caller on-line.

119. A process according to claim 118, further including a step of aborting interaction between said telephonic communication system and said individual caller at a remote terminal during the operations of the interface and coupling said remote terminal to an interface terminal for direct personal communication.

120. A process according to claim 119, further comprising the step of:

providing prompts to said interface terminal during direct personal communication with data relating to said calls from said individual callers.

121. A process in accordance with claim 119, wherein said step of aborting interaction is controlled by the success of said individual caller in accessing said memory.

122. A process according to claim 118, wherein said qualifying step limits access by said individual callers to a predetermined period of time based on entitlement.

123. A process according to claim 118, wherein said step for receiving said call data signals further includes:

receiving calling number identification data.

124. A process according to claim 123, wherein said processing step further includes processing of at least certain of said calling number identification data to test said calling number identification data to prevent excessive use.

125. An analysis control system for use with a communication facility including remote terminals for individual callers, wherein each of said remote terminals may comprise a conventional telephone instrument including voice communication means, and digital input means in the form of an array of alphabetic numeric buttons for providing data, said analysis control system comprising:

an interface structure coupled to said communication facility to interface said remote terminals for voice and digital communication, and including means to provide caller data signals representative of data relating to said individual callers developed by said remote terminals;

voice generator structure coupled through said interface structure for actuating said remote terminals as to provide vocal operating instructions to said individual callers;

record structure, including memory and control means, said record structure connected to receive said caller

36

data signals from said interface structure for accessing a file relating to said individual callers including said individual callers' credit card numbers provided from said digital input means through said interface structure;

credit verification structure to verify on-line said credit card numbers wherein said credit verification structure at least verifies that said individual callers' credit card numbers have not been cancelled; and

qualification structure controlled by said record structure for testing caller data signals provided by said individual callers to specify consumable participation keys for restricting the extent of access to at least a part of said system by said individual callers on the basis of entitlement.

126. An analysis control system according to claim 125, wherein said individual callers are prompted to provide certain of said caller data signals to identify said individual callers.

127. An analysis control system according to claim 125, wherein said caller data signals are indicative of initials of name or names.

128. An analysis control system according to claim 125, wherein said caller data signals are indicative of caller social security number data.

129. An analysis control system according to claim 125, wherein said caller data signals are indicative of caller PIN data.

130. An analysis control system according to claim 125, wherein calling number identification signals are automatically provided by said communication facility.

131. An analysis control system according to claim 130, wherein said caller data signals further are indicative of caller social security number data.

132. An analysis control system according to claim 131, wherein said qualification structure restricts said extent of access by each of said individual callers to a single use entitlement.

133. An analysis control system according to claim 125, wherein said qualification structure restricts said extent of access to a limited number of uses.

134. An analysis control system according to claim 125, wherein said interface structure includes means to receive one called number from a plurality of called numbers (DNIS).

135. An analysis control system according to claim 134, wherein said called number identifies one of a plurality of formats.

136. An analysis control system according to claim 125, further comprising:

structure to receive calling number identification data.

137. An analysis control system according to claim 136, wherein said record structure stores said calling number identification data at least in part.

138. An analysis control system according to claim 136, further comprising:

processing structure to process at least certain of said calling number identification data.

139. An analysis control system according to claim 125, wherein certain of said caller data signals provided by said individual callers are stored in said record structure.

140. An analysis control system according to claim 125, wherein said qualification structure restricts said extent of access by each of said individual callers to a single use entitlement.

141. An analysis control system according to claim 21, wherein said individual designations include sequence data and other caller data.

5,684,863

37

142. An analysis control system according to claim 27, wherein said individual callers provide said at least one other distinct identification data element on-line and said distinct identification data element is stored for subsequent use.

143. An analysis control system according to claim 109, wherein said computer generated numbers indicate a sequence in which calls from said individual callers occur.

144. An analysis control system according to claim 109, wherein said analysis structure processes at least certain of said data relating to certain select ones of said individual callers to isolate a subset of said individual callers.

145. A process according to claim 2, wherein entitled individual callers are only allowed access during a predetermined period of time.

146. A process according to claim 3, wherein entitled individual callers are only allowed access during a predetermined period of time.

147. An analysis control system according to claim 11, wherein said caller significance is indicative of a calling order sequence.

148. An analysis control system according to claim 27, wherein said interface structure further receives voice data from said individual callers and stores said voice data for subsequent processing.

149. An analysis control system according to claim 148, further comprising:

analysis structure coupled to said record structure for processing at least certain of said data developed by said remote terminals relating to certain select ones of said individual callers to isolate a subset of said callers.

150. An analysis control system according to claim 149, wherein said qualification structure further comprises test structure coupled to said interface structure for testing data provided by said individual callers specifying a limit on use during a predetermined period of time.

151. An analysis control system according to claim 36, wherein said one other distinct identification data is PIN number data.

152. A process according to claim 68, further comprising the step of:

receiving and storing voice data signals from said individual callers responsive to voice signals provided to said individual callers.

153. A process according to claim 152, further comprising the step of:

subsequently processing said stored voice data signals.

154. A process according to claim 152, further comprising the step of:

storing said digital identification data and said answer data from said individual callers.

155. A process according to claim 68, wherein said individual callers are further qualified by testing said participation numbers to determine whether said individual callers are calling during a predetermined period of time.

156. A process according to claim 155, wherein a clock is used to qualify said individual callers with respect to said period of time.

157. An analysis control system according to claim 68, wherein said select operating format is accessed by a pay to dial number identified by called number identification signals (DNIS) and said another of said plurality of operating formats is accessed by a number other than said pay to dial called number identified by called number identification signals (DNIS).

158. A process according to claim 79, further comprising the step of:

38

receiving and storing voice data signals from said individual callers responsive to voice signals provided to said individual callers.

159. A process according to claim 158, further comprising the step of:

subsequently processing said stored voice data signals.

160. A process according to claim 158, wherein said data relating to calls from said individual callers includes said digital identification data and said answer data from said individual callers.

161. A process according to claim 79, wherein said individual callers are further qualified by testing said participation numbers to determine whether said individual callers are calling during a predetermined period of time.

162. A process according to claim 161, wherein a clock is used to qualify said individual callers with respect to said period of time.

163. A process according to claim 162, wherein said predetermined period of time is determined by a use-rate calculator.

164. A process according to claim 87, further comprising the step of:

receiving and storing voice data signals from said individual callers responsive to voice signals provided to said individual callers.

165. A process according to claim 164, further comprising the step of:

subsequently processing stored voice data signals.

166. A process according to claim 164, wherein said data relating to calls from said individual callers includes said digital identification data and said answer data from said individual callers.

167. A process according to claim 87, wherein said individual callers are further qualified by testing said participation numbers to determine whether said individual callers are calling during a predetermined period of time.

168. A process according to claim 167, wherein a clock is used to qualify said individual callers with respect to said period of time.

169. An analysis control system according to claim 93, wherein said data relating to certain select ones of said individual callers includes credit card number data.

170. An analysis control system according to claim 169, wherein said data relating to certain select ones of said individual callers includes credit card expiration date data.

171. An analysis control system according to claim 169, wherein said credit card number data is tested against unacceptable credit card numbers.

172. An analysis control system according to claim 93, wherein said interface structure receives voice data which is stored for subsequent use.

173. An analysis control system according to claim 172, wherein at least certain of said data developed by said remote terminals and at least certain of said voice data is used in subsequent processing.

174. An analysis control system according to claim 173, wherein said subsequent processing includes isolating a subset of said individual callers.

175. An analysis control system according to claim 95, wherein said data relating to certain select ones of said individual callers includes credit card number data, which is tested by said qualification structure for entitlement.

176. An analysis control system according to claim 96, wherein said identification data signals are further indicative of caller billing identification data.

177. An analysis control system according to claim 109, wherein said interface structure receives calling number

5,684,863

39

identification data signals automatically provided by said communication facility, which are tested by said qualification structure with respect to a limit on use to determine if at least certain of said individual callers are entitled to access.

178. An analysis control system according to 109, wherein said individual callers provide caller PIN number data online for subsequent identification of said individual callers.

179. An analysis control system according to claim 116, wherein said caller personal identification data is PIN number data.

180. An analysis control system according to claim 117, wherein at least certain of said individual callers are transferred to an operator attended terminal and at least certain of said data entered by said individual callers is displayed at said operator attended terminal.

181. A process for controlling operations of an interface with a telephone communication system, said process including the steps of:

providing key numbers specifying limits on use to entitle individual callers to access said operations of the interface with said telephone communication system;

coupling remote terminals to said interface for providing voice signals to said individual callers and generating said voice signals for actuating said remote terminals as to provide vocal operating instructions to specific ones of said individual callers;

receiving said key numbers as digital identification data from said individual callers responsive to said voice signals and answer data provided from said remote terminals under control of said individual callers;

qualifying said individual callers by testing to determine if said individual callers are entitled to access said operations of the interface by testing said key numbers for said individual callers against stored key numbers to ensure their validity and testing said key numbers based on said limits on use for said individual callers and accordingly providing approval signals for qualified individual callers;

accessing a memory with said key numbers for said individual callers and storing data relating to calls from said individual callers; and

processing at least certain of said answer data responsive to said approval signals.

182. A process for controlling operations of an interface with a telephone communication system according to claim 181, where said key numbers are included in packaging of products.

183. A process for controlling operations of an interface with a telephone communication system according to claim 181, wherein certain of said voice signals provided to said individual callers indicate computer generated number data formed during operations of said interface.

184. A process for controlling operations of an interface with a telephone communication system according to claim 181, where said key numbers are coded.

185. A process for controlling operations of an interface with a telephone communication system according to claim 181, wherein said processing step processes answer data to isolate a subset of said individual callers.

186. A process for controlling operations of an interface with a telephone communication system according to claim 181, wherein said individual callers provide credit card number data as additional digital identification data or said answer data, which is verified and stored in said memory.

40

187. A process for controlling operations of an interface with a telephone communication system according to claim 181, wherein said operations of the interface are in accordance with a select processing format of a plurality of processing formats identified by called terminal digital data signals (DNIS) provided automatically by said telephone communication system, further comprising the steps of:

providing access to said operations of the interface in accordance with said select processing format with a pay to dial number and providing access to said operations of the interface in accordance with another of said processing formats with a number other than said pay to dial number.

188. A process for controlling operations of an interface with a telephone communications system, said process including the steps of:

providing products carrying key numbers for participation specifying limits on use to entitle individual callers to access said operations of the interface with said telephone communications system;

coupling remote terminals to said interface for providing voice signals to said individual callers and generating said voice signals for actuating said remote terminals as to provide voice operating instructions to specific ones of said individual callers;

receiving digital identification data from said individual callers responsive to said voice signals including said key numbers for said individual callers and answer data provided from said remote terminals under control of said individual callers;

qualifying said individual callers by testing to determine if said individual callers are entitled to access said operations of the interface based on said limits on use specified by said key numbers for said individual callers and accordingly providing approval signals for qualified callers;

accessing a memory with said key numbers for said individual callers and storing data relating to calls from said individual callers; and

providing certain of said voice signals to said individual callers to indicate computer generated number data formed during operations of the interface.

189. A process according to claim 188, wherein said computer generated number data is stored in said memory.

190. A process according to claim 189, wherein said computer generated number data is stored in association with said digital identification data.

191. A process according to claim 188, further comprising the step of:

providing said key numbers in packaging of said products.

192. A process according to claim 188, further comprising the step of:

processing at least certain of said answer data to isolate a subset of callers.

193. A process according to claim 188, wherein caller credit card number data is received from said individual callers as additional digital identification data or said answer data.

194. A process according to claim 188, wherein said computer generated number data is indicative of a calling order sequence of said individual callers.

195. An analysis control system for use with a communication facility including remote terminals for individual callers, wherein each of said remote terminals may comprise a conventional telephone instrument including voice com-

5,684,863

41

munication means and digital input means in the form of an array of alphabetic numeric buttons for providing data, said analysis control system comprising:

interface structure coupled to said communication facility to interface said remote terminals for voice and digital communication and including means to provide signals representative of data developed by said remote terminals and including structure to control processing formats of said analysis control system in accordance with signals automatically provided by said communication facility indicative of one of a plurality of called numbers (DNIS) wherein said one of a plurality of called numbers identifies a select processing format from a plurality of processing formats;

voice generator structure selectively coupled through said interface structure to said remote terminals for providing vocal operating instructions to individual ones of said callers;

record memory connected to said interface structure for accessing a file and storing data relating to certain select ones of said individual callers including voice data and digital data developed by said remote terminals; and

analysis structure connected to said record memory for processing at least certain of said data relating to certain select ones of said individual callers to isolate a subset of said callers, wherein processing of said certain of said data includes accumulating multiple different personal identifying data provided by said select ones of said individual callers and considering said multiple different data by logic comparisons to isolate said subset of said callers.

42

196. An analysis control system according to claim 195, wherein certain of said caller data signals provided by said individual callers are stored in said record structure.

197. An analysis control system according to claim 195, wherein said analysis structure provides individual designations including sequence data and other caller data.

198. An analysis control system according to claim 195, wherein said select processing format is accessed by a pay to dial called number received over a pay to dial network and identified by called number identification data signals (DNIS).

199. An analysis control system according to claim 198, wherein at least one other of said processing formats is accessed by a number other than said pay to dial called number and identified by called number identification data signals (DNIS).

200. An analysis control system according to claim 199, further comprising:

qualification structure coupled to said interface structure for qualifying at least certain of said individual callers for access to said select processing format by testing key numbers specifying a limit on use provided by said certain of said individual callers as part of said digital data developed by said remote terminals.

201. An analysis control system according to claim 200, wherein said digital data developed by remote terminals includes personal information data on at least said certain of said individual callers including age data.

202. A process according to claim 122, further including a step of limiting access by a caller to said memory under control of a clock.

* * * * *

EXHIBIT 7



US005815551A

United States Patent [19]

Katz

[11] **Patent Number:** **5,815,551**
 [45] **Date of Patent:** ***Sep. 29, 1998**

[54] **TELEPHONIC-INTERFACE STATISTICAL ANALYSIS SYSTEM**

[75] Inventor: **Ronald A. Katz**, Los Angeles, Calif.

[73] Assignee: **Ronald A. Katz Technology Licensing, LP**, Los Angeles, Calif.

[*] Notice: The term of this patent shall not extend beyond the expiration date of Pat. No. 4,845,739.

[21] Appl. No.: **473,320**

[22] Filed: **Jun. 7, 1995**

Related U.S. Application Data

[63] Continuation of Ser. No. 335,923, Apr. 10, 1989, which is a continuation of Ser. No. 194,258, May 16, 1988, Pat. No. 4,845,739, which is a continuation-in-part of Ser. No. 18,244, Feb. 24, 1987, Pat. No. 4,792,968, which is a continuation-in-part of Ser. No. 753,299, Jul. 10, 1985, abandoned.

[51] **Int. Cl.**⁶ **H04M 1/66; H04M 3/50; H04M 11/08**

[52] **U.S. Cl.** **379/88; 379/91.02; 379/127; 379/189; 379/198; 379/265**

[58] **Field of Search** 379/67, 88, 89, 379/92, 97, 127, 142, 201, 207, 245, 246, 247, 265, 266, 189, 92.01, 92.03, 93.27, 93.25, 198, 196, 91.02, 91.01

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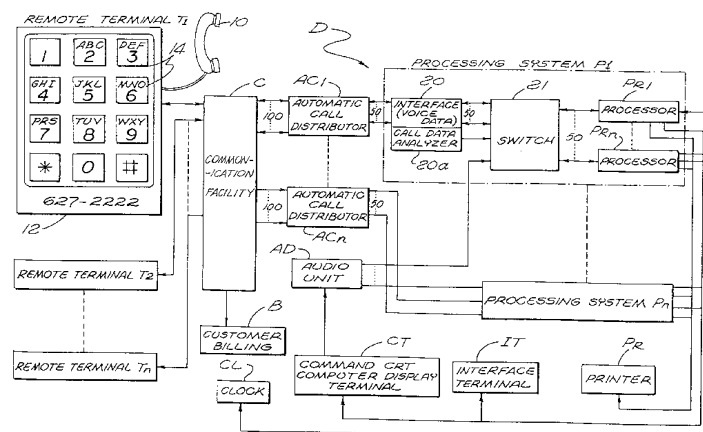
Attorney, Agent, or Firm—Lyon & Lyon LLP

[57]

ABSTRACT

A system D interfaces with a multiplicity of individual terminals T1-Tn of a telephone network facility C, at the terminals callers are prompted by voice-generated instructions to provide digital data that is identified for positive association with a caller and is stored for processing. The caller's identification data is confirmed using various techniques and callers may be ranked and accounted for on the basis of entitlement, sequence or demographics. Callers are assigned random designations that are stored along with statistical and identification data. A break-off control circuit may terminate the computer interface aborting to a terminal for direct communication with an operator. Real-time operation processing is an alternative to stored data. The accumulation of stored data (statistical, calling order sequence, etc.) is variously processed and correlated as with developed or established data to isolate a select group or subset of callers who can be readily identified and reliably confirmed. Different program formats variously control the processing of statistical data as for auction sales, contests, lotteries, polls, commercials and so on.

35 Claims, 6 Drawing Sheets



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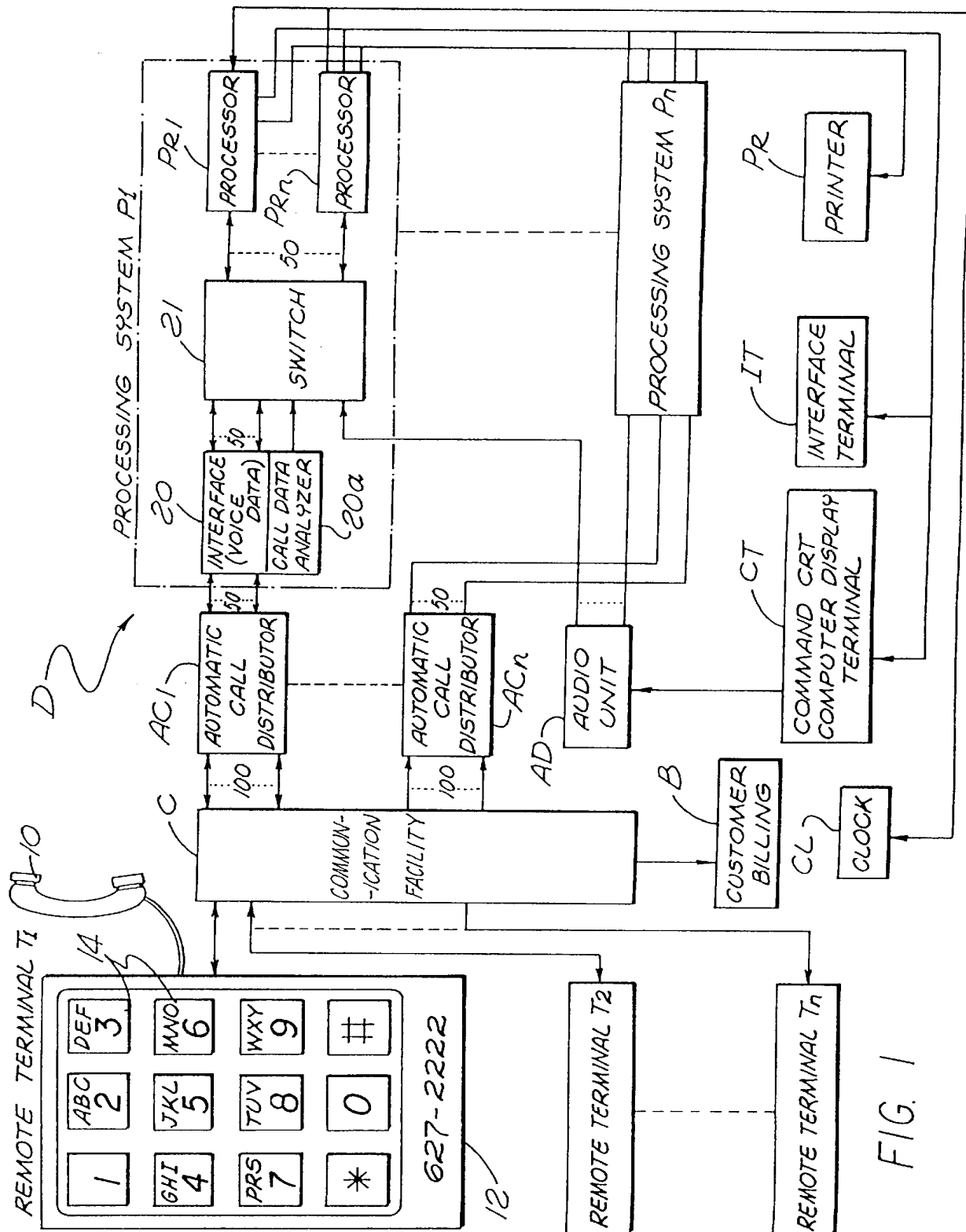
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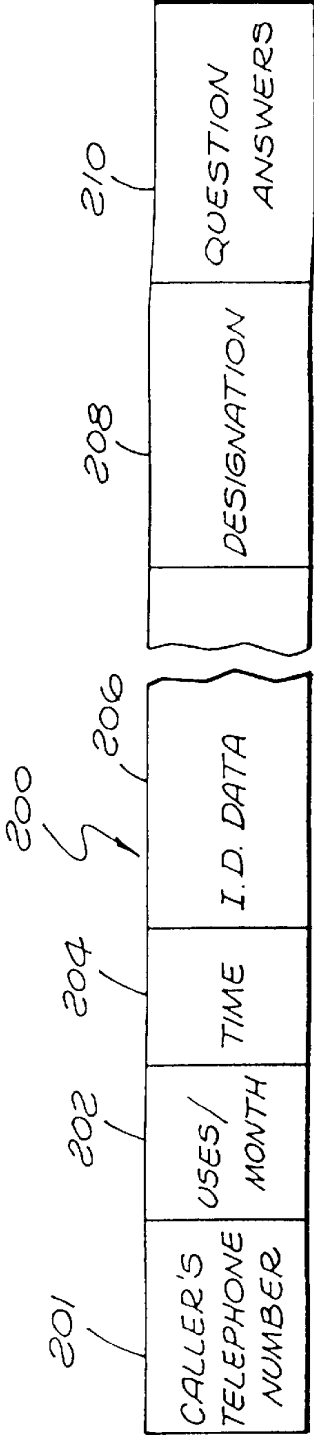
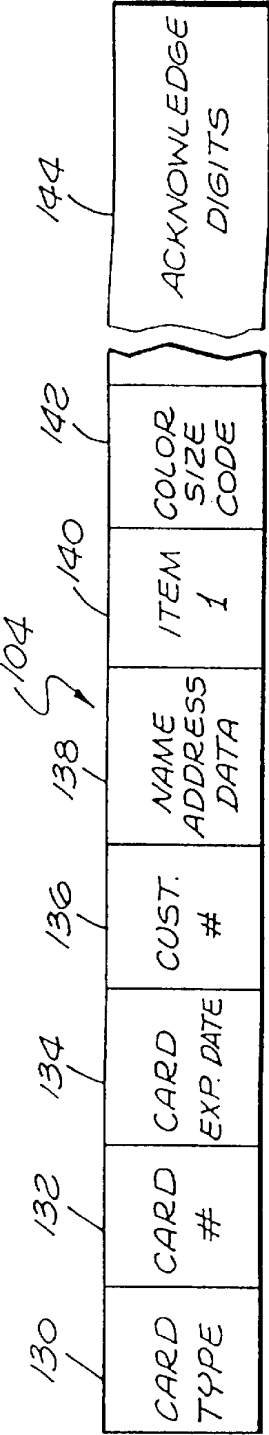
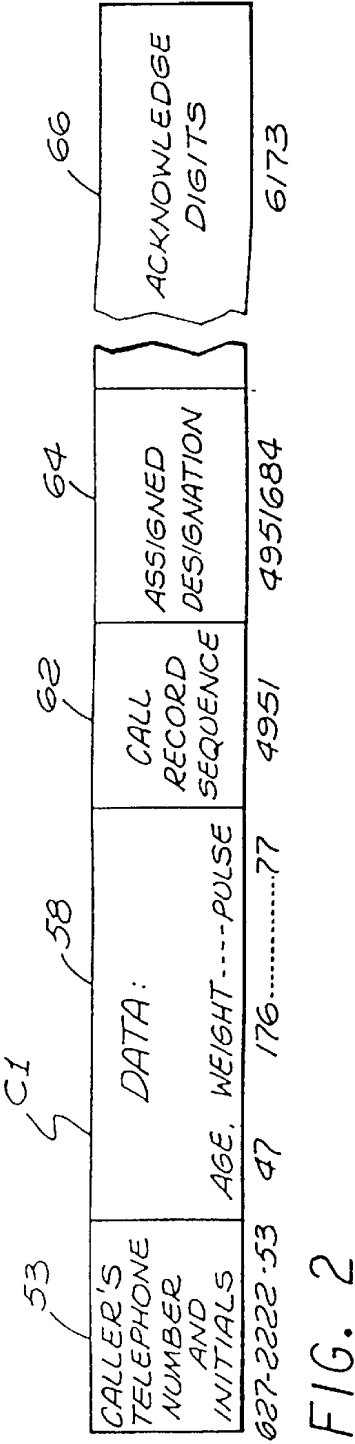
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U.S. Patent

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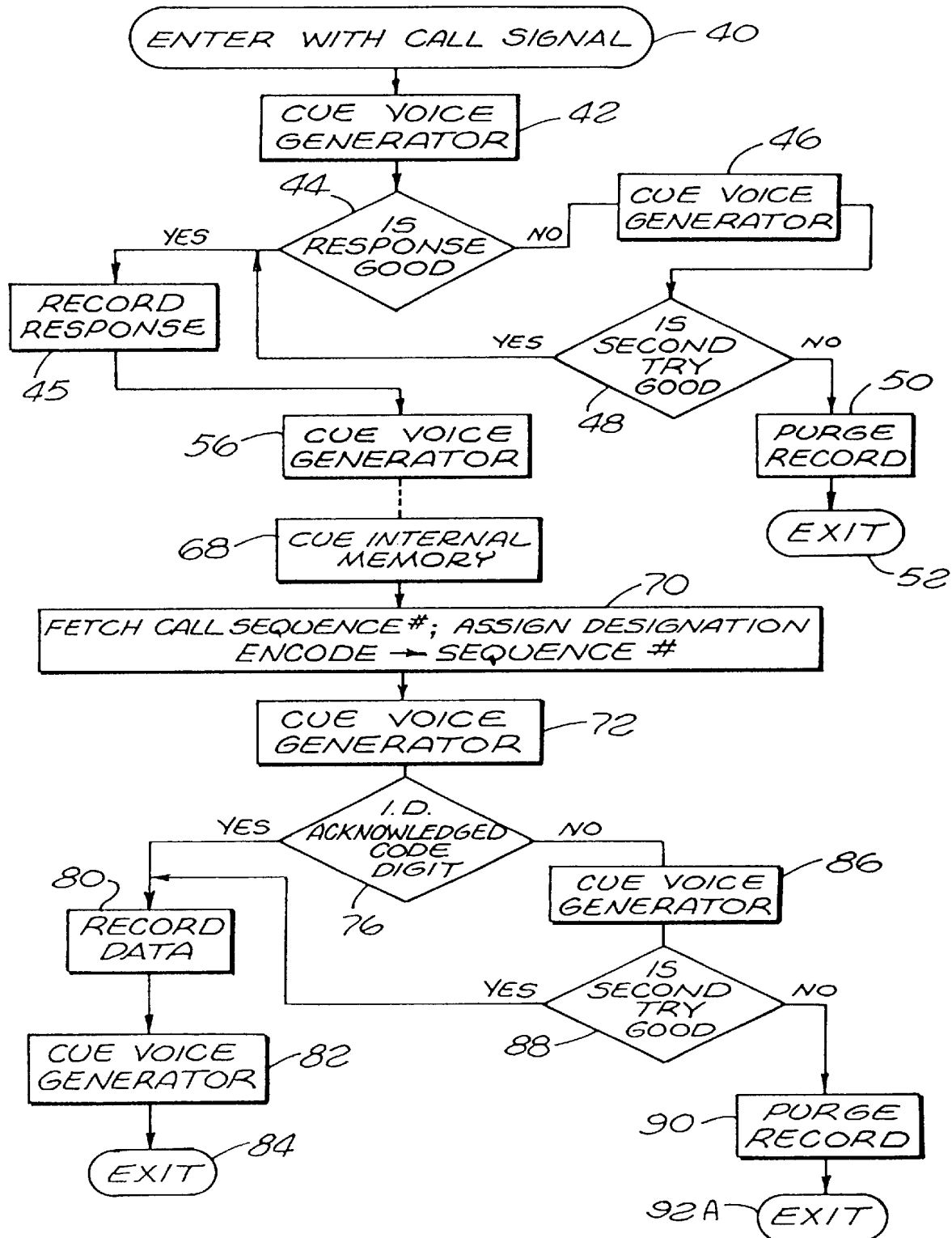


FIG. 3

U.S. Patent

Sep. 29, 1998

Sheet 4 of 6

5,815,551

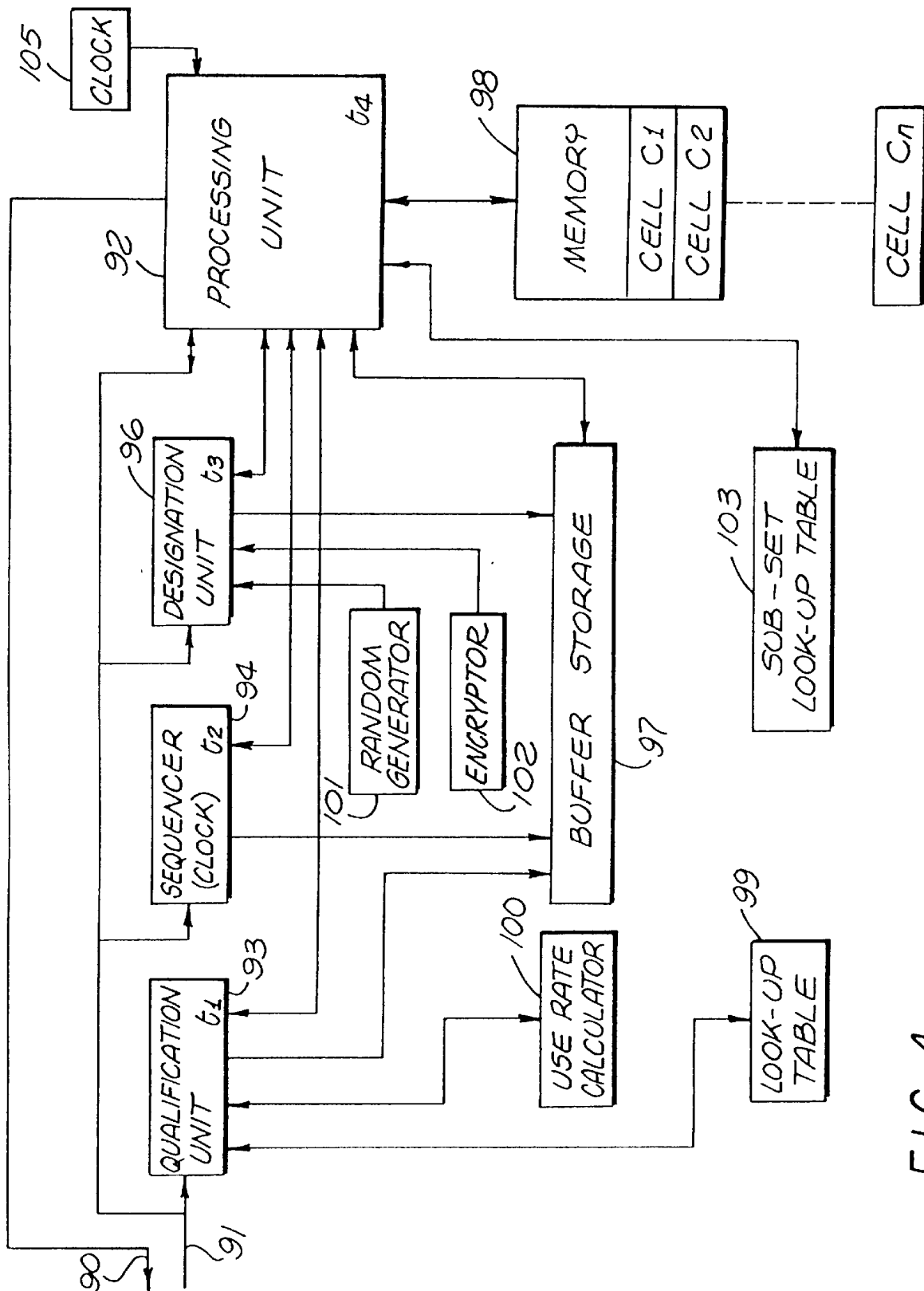


FIG. 4

U.S. Patent

Sep. 29, 1998

Sheet 5 of 6

5,815,551

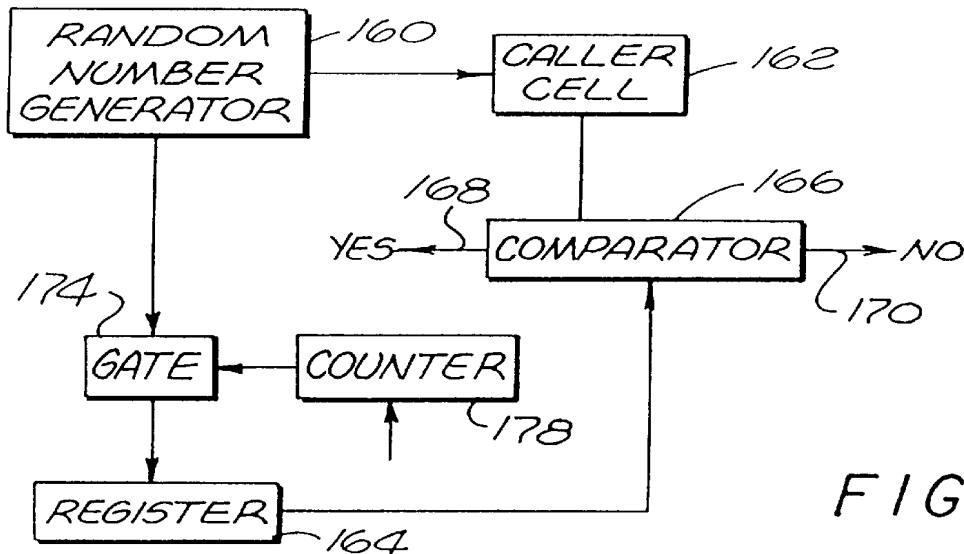


FIG. 6

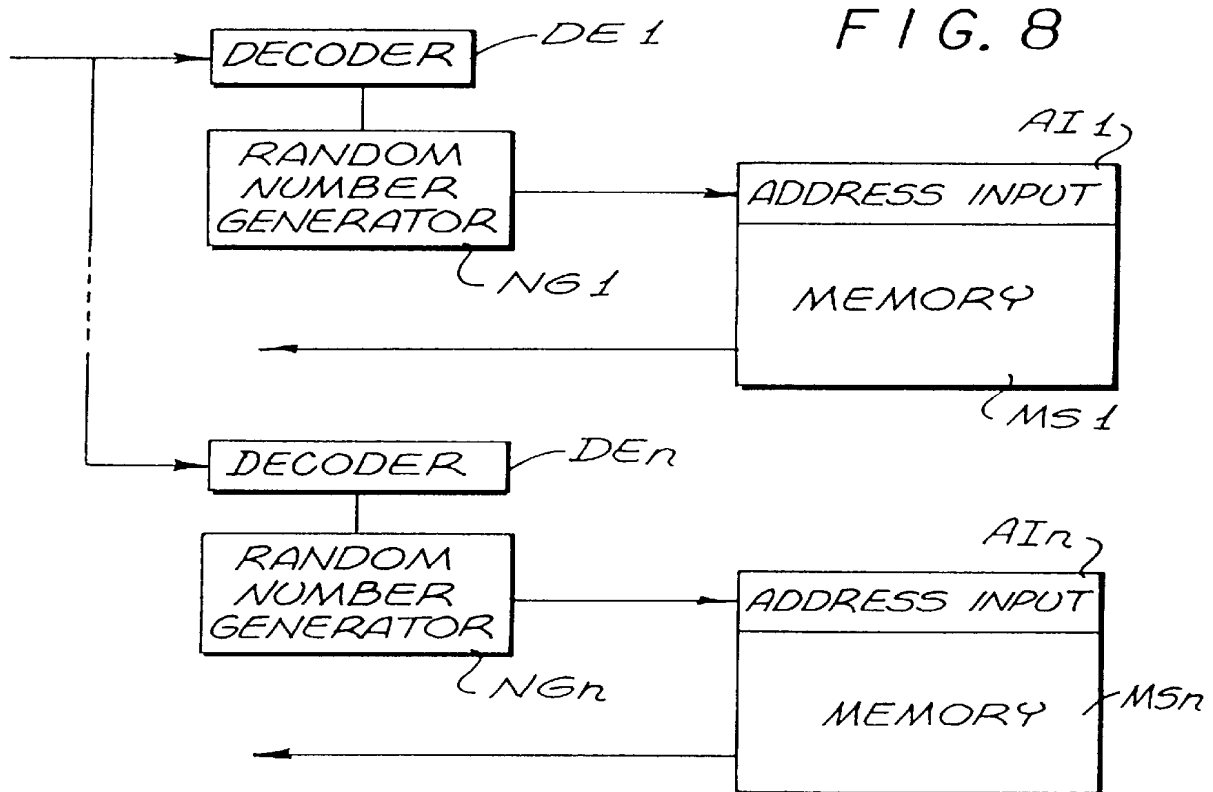


FIG. 8

U.S. Patent

Sep. 29, 1998

Sheet 6 of 6

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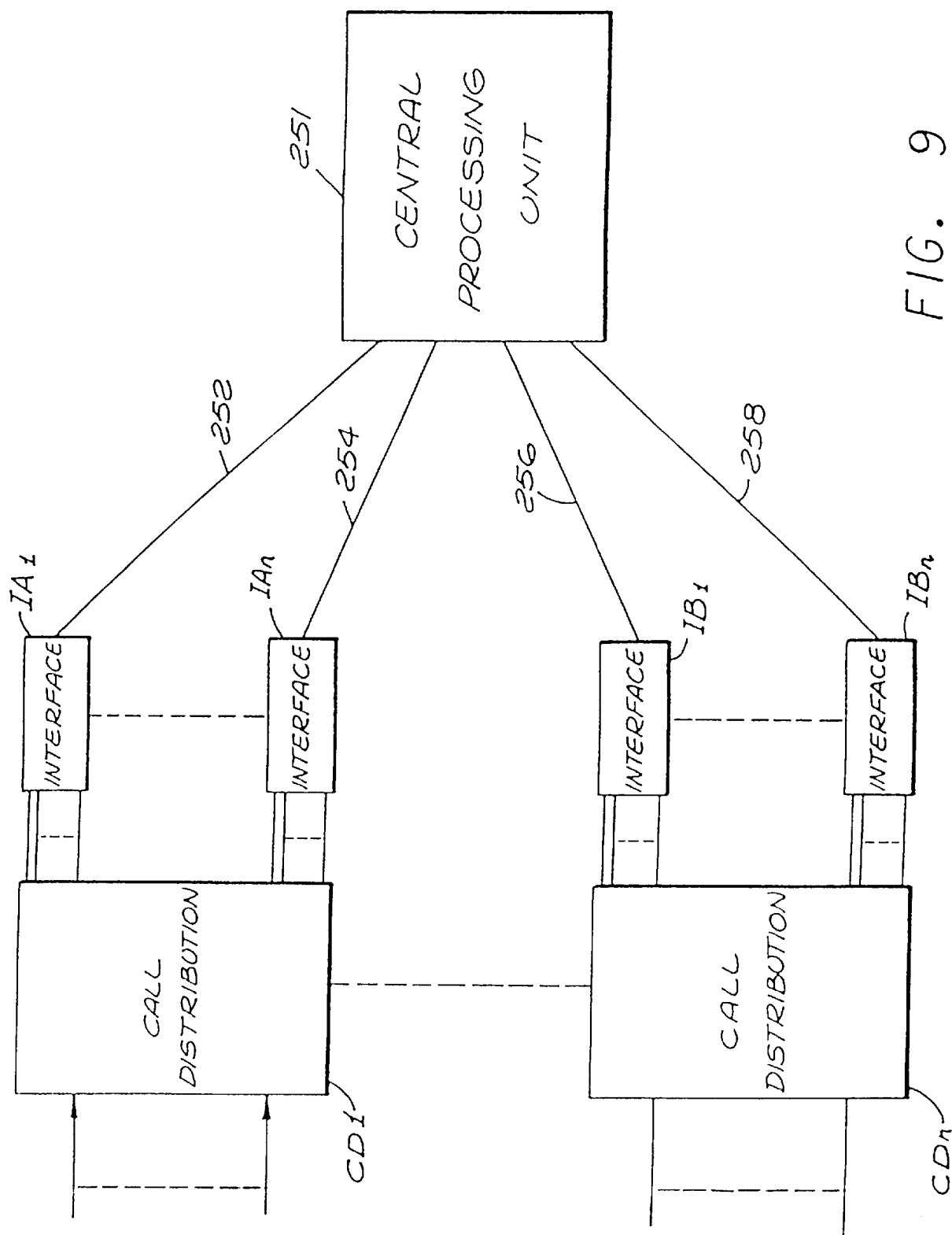


FIG. 9

5,815,551

1

TELEPHONIC-INTERFACE STATISTICAL ANALYSIS SYSTEM

BACKGROUND AND SUMMARY OF THE INVENTION

This is a continuation application of application Ser. No. 07/335,923 filed Apr. 10, 1989, and entitled "Telephonic-Interface Statistical Analysis System", which was a continuation of application Ser. No. 07/194,258 filed May 16, 1988, and entitled "Telephonic-Interface Statistical Analysis System", now U.S. Pat. No. 4,845,739, which is a continuation-in-part of application Ser. No. 07/018,244 filed Feb. 24, 1987, and entitled "Statistical Analysis System For Use With Public Communication Facility", now U.S. Pat. No. 4,792,968, which is a continuation-in-part of application Ser. No. 06/753,299 filed Jul. 10, 1985, and entitled "Statistical Analysis System For Use With Public Communication Facility" (now abandoned).

Various forms of publicly accessible communication systems for providing access to a central station have been proposed, some involving telecommunications. However, sometimes a need for ancillary functions arise in that regard, e.g. it may be desirable to positively identify a large group of persons, as a demographically controlled group, or a specifically entitled group, then statistically analyze data from the group so as to accurately identify certain persons in the group and select a subset of at least one person. Specifically, it may be desirable to obtain medical data from an entitled group of people, to correlate such data, perhaps introduce external data, then identify a select subset of the group. In that regard, a need exists for an improved, effective, economical, and expedient system of telecommunication incorporating means for performing qualification, identification, analysis and selection of individual persons.

It has been proposed to interface persons at telephone calling stations directly with a computer facility. In accordance with such arrangements, recorded voice messages prompt callers to provide data by actuating the alphanumeric buttons that are conventionally employed for dialing from one telephone station to another. In one prior arrangement, a caller may actuate dialing buttons to selectively attain a communication channel or to address specific information in a computer. In another arrangement, dialing buttons may be actuated to specify a billing designation as for requested services. Generally, such systems are believed to have been somewhat limited in scope, often involving difficulties that are frustrating or confusing to a caller. Nevertheless, such techniques have been widely used to enhance and broaden communication.

In general, the present invention comprises a telephonic-interface system and related process for selectively utilizing both analog (voice) and digital telephonic communication in a variety of different interface formats or programs, as to select or qualify a set of callers, enable positive identification of at least certain of the callers in the set, acquire data from callers in the set, statistically analyze acquired data, as in combination and in association with external data (time independent), and accordingly to isolate a subset of the callers with verifiable identification. That is, the external data (separate from caller-provided data) may be introduced at any of a variety of different times in relation to the caller data.

For example, a voice origination apparatus may prompt individual callers who (after qualification) provide select digital data to develop a record for further processing either immediately, upon the evolution of a defined set of callers or

2

upon the establishment of select external data. Thus, following a qualification phase, the information acquisition phase may be concurrent or consecutive with respect to the processing phase. When appropriate, abort capability allows a caller to remain "off hook" and go to analog (vocal) communication. The caller then interfaces directly with an operator. For example, as disclosed in detail below, the calling number (ANI) is provided by the communication facility, and may be registered to correlate data in relation to the callers.

The system of the present invention may qualify an entitled set of callers, then receive answer data in the course of the call and develop identification or designation data, sequence data and statistical data. The system may then provide data cells for storing individual data while assigning confirmable identifications to the entitled set. From the set, a subset is defined. That is, in accordance with various formats, acquired data is processed in statistical relationship, or in relation to applied external data to accomplish such functional operating formats as an auction sale, a contest, a lottery, a poll, a merchandising operation, a game, and so on.

A variety of memory techniques are used to selectively activate the voice origination apparatus. Accordingly, statistical analysis and selection can be effectively and economically accomplished with respect to a substantial set of callers who are accommodated individual communication through a telephone system.

BRIEF DESCRIPTION OF THE DRAWINGS

In the drawings, which constitute a part of this specification, exemplary embodiments exhibiting various objectives and features hereof are set forth, specifically:

FIG. 1 is a block diagram of a system constructed in accordance with the present invention;

FIG. 2 is a fragmentary diagrammatic representation of a storage cell format as may be developed in the system of FIG. 1;

FIG. 3 is a flow diagram of one operating format of the system of FIG. 1;

FIG. 4 is a block diagram of a form of processor or function unit as may be employed in the system of FIG. 1;

FIG. 5 is a fragmentary diagrammatic representation of a storage cell format as may be developed in the system of FIG. 1 with the processor of FIG. 4;

FIG. 6 is a block diagram of elements in an operating function unit of FIG. 4;

FIG. 7 is a diagrammatic representation of a storage cell format as may be developed in the system of FIG. 4; and

FIG. 8 is a block diagram of elements in an operating function unit of FIG. 4.

FIG. 9 is a block diagram of an alternate embodiment, showing a distributed-component arrangement of geographically spaced call distributors.

DESCRIPTION OF THE ILLUSTRATIVE EMBODIMENTS

As required, detailed illustrative embodiments of the present invention are disclosed herein. However, physical communication systems, data formats, and operating structures in accordance with the present invention may be embodied in a wide variety of forms, some of which may be quite different from those of the disclosed embodiments. Consequently, the specific structural and functional details disclosed herein are merely representative; yet in that regard,

5,815,551

3

they are deemed to afford the best embodiments for purposes of disclosure and to provide a basis for the claims herein which define the scope of the present invention.

Referring initially to FIG. 1, a series of remote telephone-instrument terminals T1 through Tn are represented (left). The terminals are generally similar, and accordingly, only the terminal T1 is illustrated in detail.

In the disclosed embodiment, the remote terminals T1 through Tn represent the multitude of conventional telephone terminals that are coupled to a communication facility C which may take the form of a comprehensive public telephone system for interconnecting any associated terminals T1-Tn. In accordance with the present system, the terminals T1-Tn operate through the communication facility C to be coupled with a central station D, an embodiment of which is illustrated in some detail.

Generally in accordance with the present development, individual callers use the individual telephone stations T1 through Tn to interface the station D through the communication facility C. Callers may be screened or qualified. Also in accordance herewith, the data of individual callers may be collected, correlated and tested in the station D for processing in accordance with various programs and external data. As a consequence, various objectives are accomplished. For example, a select subset of the callers may be isolated and specifically identified, or related data may be processed, or transactions may be actuated. The possibilities for application of the system are substantial and varied as will be apparent from the exemplary structure and functions as described in detail below.

In one operating process format, the public might be polled with regard to locating the specific purchasers of a defective or dangerous product. Alternatively, the public might be polled with the objective of locating persons susceptible to a specific ailment or disease. Public auctions of unprecedented participation are possible. Legal lotteries are enabled that are interesting, effective and very economical on an individual participant basis. The system also might be employed in various game formats or to automate a promotion or mail-order operation, even to the extent of including inventory control as detailed below.

In each functional operating format, the callers may be variously qualified on the basis of entitlement and may be identified for subsequent verification. The callers then may be prompted, either through the interface or externally, to provide appropriate data.

Considering the system of FIG. 1 in somewhat greater detail, it is to be understood that the communication facility C has multiplexing capability for individually coupling the terminals T1-Tn to the central station D on request. In the illustrative embodiment of the system, the communication facility C comprises a public telephone network and the individual terminals T1-Tn take the various forms of existing traditional or conventional telephone instruments.

The exemplary telephone terminal T1 is represented in some detail to include a hand piece 10 (microphone and earphone) and a panel 12 provided with a rectangular array of push buttons 14 in the conventional configuration. Of course, the hand piece 10 accommodates analog signals while the panel 12 is a digital apparatus. Generally in accordance herewith, the hand piece 10 serves to manifest analog signals vocally to the caller.

In accordance with conventional telephone practice, alphabetic and numeric designations are provided on the buttons 14. For example, several of the buttons 14 carry three letters along with a decimal digit. Specifically, the

4

button designated with the numeral "2" also carries the letters "A", "B" and "C". In that manner, the buttons 14 encompass the numerals "0-9", two symbols, and the alphabet except for the letters "Q" and "Z". Consequently, the buttons 14 accommodate the entry of decimal data, and to some extent alphabetic data.

The buttons 14 designated with symbols "*" and "#", along with the numeral "0", can be used by predetermined assignment to represent the letters "Q" and "Z" or any of a variety of other data or command components. Generally, in accordance herewith, the buttons 14 are employed to formulate digital data at the central station D in various formats determined by the instant specific use and operating format of the system.

Considering the central station D in somewhat greater detail, the communication facility C is coupled to interface a series of processing systems P1 through Pn (FIG. 1, left). Specifically, the communication facility C is connected to the processing systems P1-Pn through an associated series of automatic call distributors AC1 through ACn. Each of the automatic call distributors AC1-ACn accommodates one hundred lines from the communication facility C and accordingly, may accommodate and queue up to 100 calls.

Each of the automatic call distributors AC1-ACn may take various forms as well known in the prior art, functioning to queue incoming calls for connection to a lesser number of lines. In the disclosed embodiment, from each of the call distributors AC1-ACn, fifty lines are connected respectively to the individual data processing systems P1-Pn through an interface 20 and a switch 21. Thus, in the disclosed embodiment, each of the automatic call distributors AC1-ACn can accommodate one hundred lines, fifty of which may be active in association with one of the processing systems P.

The processing systems P1-Pn are similar, therefore, only the processing system P1 is shown in any detail. Collectively, the processing systems P1-Pn are interconnected with a command computer terminal CT, at least one interface terminal IT, at least one printer PR and an audio unit AD. The command terminal CT is separately coupled to the audio unit AD.

As represented; the processing systems P1 through Pn each contain a number of individual function units or processors PR1 through PRn. Although various other configurations and arrangements may be employed, the explanation is facilitated by including a plurality of individual function units as treated in detail below.

Considering the processing system P1, fifty lines from the automatic call distributor AC1 are connected to the interface 20, an exemplary form of which may be a commercially available Centrum 9000 unit. The interface 20 incorporates modems, tone decoders, switching mechanisms, DNIS and ANI capability (call data analyzer 20a) along with voice interface capability. Note that the interface may actually perform analysis on data. However, to preserve the disclosed embodiment manageable, major analysis is explained with reference to processors.

Generally, DNIS capability is a function of the communication facility C (composite telephone system) to provide called terminal digital data indicating the called number. ANI capability is a similar function whereby the digital data indicates the calling number with calling terminal digital signals. Both capabilities are available for use with equipment as the interface 20 and to provide control through the call data analyzer 20a.

Accommodating up to fifty independent calls on separate communication paths to the central station D, the interface

5,815,551

5

20 is capable of providing analog (voice) signals to prompt each caller. Also accommodated are digital signals including the DNIS and ANI signals. The system contemplates the possibility of utilizing sequences of lines in rotary as well as blocking sequences of lines, the numbers for which command a particular program or operation format of a function unit as disclosed in detail below.

The interface **20** provides the connection of the fifty lines to a switch **21** which is in turn coupled to fifty function units, or processors **PR1-PRn**. As indicated above, multiple function units, or processors, are described in the disclosed embodiment to facilitate the explanation. Of course, non-parallel techniques and multiplexed operations might well be employed as alternatives. For a similar reason, as disclosed herein, each of the processors **PR1-PRn** includes memory cells for each of the callers' individual data. Development and compilation of data in such cells according to various operating formats is described below. In the disclosed embodiment, the processors **PR1-PRn** are connected collectively to the command computer terminal **CT** (incorporating a CRT display), the interface terminal **IT**, and the printer **PR**. Note that the CRT display serves to visually display data regarding select subsets as explained in detail below.

Exemplary detailed structures for the processors **PR1-PRn** are described below; however, in general, the units may comprise a microcomputer, for example, programmed as suggested above and as disclosed in detail below to accomplish specific operating formats. As an integral part of such formats, a caller may be qualified as belonging to an entitled set of persons or to accommodate specific demographic objectives. Also, callers may be designated both with respect to their significance and their identification. For example, callers may have different significance in a format, depending on the time or sequence of their call. Also, the designation of a caller may be exceedingly important in relation to the caller eventually being isolated as part of a subset, the members of whom must be accurately verified. As described below, the designations may involve multiple elements which may include: random number assignments, encryption techniques, utilization of calling numbers, identification data, sequence of call and so on to facilitate reliable verification. Note that the communication facility **C** has a customer billing structure **B** that is interfaced by the system.

On the qualification and designation of callers, the system enters a data accumulation phase during which digital data (formatted at one of the telephone terminals **T1-Tn**) is processed by one of the processors **PR1-PRn**. In general, the processing evolves a subset (at least one caller) the members of which may be verified and confirmed.

Either during the data accumulation phase, or after the processing phase to isolate a subset, a distinct operation may involve actuating the interface terminal **T1** for direct local communication between the caller and an operator at the terminal **T1**. Another distinct operation may involve actuation of the printer **PR** to provide documents in relation to the operating format, as for providing award certificates as for verifying members of an isolated subset. Also, charge slips may be generated containing at least part of the data of a particular transaction.

An appreciation of the philosophical operation of a system in accordance with the present invention may now be enhanced by considering an exemplary operation of the illustrative embodiment of FIG. 1 to isolate a subset of people who are susceptible to a particular disease or infir-

6

mity. The exemplary operation might involve a geographical-area, as a large city or population center, in which a particular health problem is somewhat acute. For example, a major population center might be polled where coronary artery disease is a significant problem. Accordingly, persons most susceptible to such disease could be identified for corrective recommendations.

People of the population center could be informed of the availability of a service for statistical health analysis. Accordingly, persons interested in their individual statistical situation would be motivated to utilize the service. Specifically, individual callers would use the remote terminals **T1-Tn** to contact the central station **D** through the communication facility **C** and thereby provide personal information that would enable a statistical analysis in relation to existing data so as to isolate and inform (either real time or batch basis) those persons statistically most likely to be in need of corrective measures. In such applications, it may be important that the caller's identity be subject to reliable verification. Other applications or programs also may present a critical need for positively verifiable identification to the extent that credit card numbers and/or personal identification numbers may be employed.

An exemplary operation of the system, with regard to a specific caller, will now be treated referring somewhat concurrently to FIGS. 1, 2 and 3. As indicated above, FIG. 2 indicates a data storage format for a memory cell in an exemplary processor **PR** and now will be considered with regard to an operating format in which data is composed for a caller. Pursuing the above example, assume the existence of a caller at the remote terminal **T1** (telephone number (213) 627-2222) who wishes to pursue health-related information on the basis of statistical analysis. The caller lifts the hand piece **10** and in accordance with conventional techniques actuates the push buttons **14** to call for a select operating format, e.g. telephone number (213) 627-3333 and thereby establish communication through the facility **C** with a designated function unit in the central station **D**. Receiving the call signal, the automatic call distributor **AC1** associates the called number ((213) 627-3333, rendered available using standard telephone DNIS techniques) through the interface **20** and the switch **21** to attain connection with the specific processor, e.g. the processor **PR1** formatting the health-related program. Accordingly, the processor **PR1** cooperates with the interface **20** to cue the interface **20** to operate as a voice generator.

The sequence of operations is represented to be initiated in FIG. 3 by the "enter" block **40** which is accordingly followed by a "cue voice generator" command block **42**. If the ANI equipment is not employed, the voice generator in the interface **20** formulates speech, a representative form of which might be: "Thank you for participating in the coronary artery disease statistical analysis. Please give us your telephone number by actuating the call buttons on your telephone instrument." Acting on the instructions, the caller would push the buttons **14** in sequence to indicate his telephone number, e.g. "(213) 627-2222". Alternatively, the interface **20** can accept the calling number ((213) 627-2222) according to its provision by standard ANI equipment of the communication facility **C**.

The resulting data signals are communicated from the interface unit **20** (FIG. 1) to the processor **PR1** for testing the telephone number as valid or entitled. Essentially, the format of a proper number prompts production of a valid or "good" signal. The test is indicated by the block **44** (FIG. 3). If the response is not valid or entitled, for example contains an inappropriate number of digits or has been used to a point of

5,815,551

7

excess, the operation of block 46 is initiated again cuing the voice generator 30 (FIG. 1). The voice generator accordingly instructs the caller, e.g.: "You have not entered a proper telephone number. Please reenter your telephone number by pressing the appropriate call buttons." The caller is then allotted a predetermined period of time to make a proper entry with the consequence that the system moves to a test operation as indicated by the block 48 (FIG. 3). Specifically, block 48 poses the query: "Is the second try good?"

If the caller is again unsuccessful, the system purges the record as indicated by the block 50 and the call is terminated as indicated by the block 52. In an alternative mode, the processor PR1 may abort the interface and couple the interface terminal IT for direct personal communication with the caller. The interchange would then proceed, person-to-person.

If the caller responds with a proper telephone number, the operation proceeds. Specifically, the system sequences to record the response of the proper telephone number as indicated by the block 45. That is, the caller's telephone number is recorded in an assigned specific memory cell identified with the caller. The format of the cell C1 is indicated in FIG. 2. The first portion, section 53, contains a form of identification data, i.e., the caller's telephone number, i.e. "(213) 627-2222".

Note that as explained above, if the second attempt to formulate a proper number is successful, as manifest by the block 40 (FIG. 3), the response is recorded at that stage. In either case, exiting from the block 54 (FIG. 3) invokes the next operation of again queuing the voice generator as indicated by the block 56.

As an alternative format, if a selective-group polling operation is performed, or callers are otherwise to be cleared for entitlement as mentioned above, a caller may be qualified by providing a "one-time" key number. The processor PR1 may incorporate a look-up table for proper key numbers which numbers may be coded using any of a wide variety of techniques. As a simple illustrative example, the key may comprise a precise number of digits that always total a particular numerical value.

The system proceeds after the caller is qualified. Specifically, the cue to the voice generator of the interface 20 (FIG. 1) as represented by the block 56 produces a request for further information from the caller with further identification data and answer data. For example, the voice generator might request information by stating: "Please use the telephone buttons to indicate initials of your name." The detailed operation is not represented in FIG. 3 as it is similar to the operation illustrated by the blocks 42 through 54. However, again, a proper response is registered in the storage cell C1 as illustrated in FIG. 2 by the number "53" also registered in the first section 53 of the cell.

The cycle of obtaining digital information from the caller next is repeated with respect to answer data, i.e. specific health data. For example, as illustrated in FIG. 2, the next section 58 in the cell C1 receives an accumulation of health data, including the caller's age, weight, . . . , pulse rate, and so on. Representative digital numbers are illustrated in FIG. 2.

During the course of the telephonic communication, the processor PR1 formulates identification data for the caller specifically including: the chronological sequence of the call, the assigned designation of the call, and a set of acknowledgment digits for the call. Such data identification is registered in the caller's assigned cell C1 in accordance

8

with the format of FIG. 2 being stored in sections 62, 64 and 66. Note that the data may be stored in a coded interrelationship. For example, the acknowledgment digits may be related to the call record sequence. In the illustrative example, the chronological order number of the caller is 4951. The acknowledge digits may be derived from the sequence number. For example, as illustrated, a coded relationship may be established by adding "two" to each of the individual record sequence digits. Considering the example numerically:

Adding without propagated carries:

4951
<u>2222</u>
6173

Note that the confirmation data as acknowledgement digits can be extremely important, as to communicate with an isolated member of a subset. For example, identification could be published or circulated, as by a television broadcast, then respondents checked by use of confirmation data that may be confidential.

Continuing with the above example, the call chronological sequence registered for the caller is 4951 as represented in the section 62 while the acknowledge digits are 6173 as registered in the section 66. Additionally, the processor PR1 develops an assigned designation number, e.g. designation "4951684", which is registered in the section 64, the acknowledge code or digits, e.g. 6173, being registered in the section 66. These values are formulated in accordance with conventional number techniques during the data acquisition phase. With the exemplary numerals formulated, the operation proceeds.

The processor PR1 (FIG. 1) cues the internal memory. That operation is indicated by the block 68 (FIG. 3). Thus, the processor PR1 fetches the call record sequence number, assigns a designation (if not previously assigned), and encodes the sequence number as the acknowledgment digits (if not previously accomplished). These operations are indicated by the block 70 (FIG. 3).

Next, the processor PR1 (FIG. 1) cues the voice generator in the interface 20, as indicated by the block 72 (FIG. 3) to provide information to the caller. Specifically, for example, the voice generator in the interface 20 (FIG. 1) might signal: "This transaction has been designated by the number 4951684, and is further identified by the acknowledgment digits 6173. Please make a record of these numbers as they will be repeated. Specifically, the designation number is 4951684. The acknowledgment digits are 6173. Please acknowledge this transaction by pressing your telephone buttons to indicate the acknowledge digits 6173." In various applications as those involving security, the order and acknowledgment of callers may be very important. Therefore, data for confirmation associated with the order is important.

The system next proceeds to the test mode as indicated by the block 76 (FIG. 3). If the caller provides the correct acknowledgment digits, the data is confirmed in the record as indicated by the block 80 and is registered in the cell C1 (FIG. 2). Additionally, the voice generator is sequenced as indicated by the block 82 (FIG. 3) to indicate the close of the communication and that the transaction is terminated as represented by the exit block 84.

In the event that a caller cannot confirm his acknowledgment digits, as indicated by the block 76, a repeat operation is performed as indicated respectively by the blocks 86 and 88. Specifically, the voice generator is queued for a second instructional message. In the event that the second attempt

5,815,551

9

also fails, the data is purged and the call discounted as indicated by block 90 and an exit block 92. If the second try is successful (test block 88), as indicated by the block 80, the record is perfected as indicated above.

As a result of the likelihood of a large number of calls, as described above, data cells in the processors PR1-PRn (FIG. 1) are developed with specific information indicative of a statistical sampling of the populace of concern. The data of that statistical sampling may be self-generating of specific conclusions with respect to a subset of individuals, and/or supplemental data to clearly manifest a significant subset. For example, the data may indicate a significant departure from an assumed normal characteristic. Such data, accumulated from the polling may be considered by logic comparisons in the computer 22 to select the subset of persons who should be isolated.

In addition to the self-generating conclusions available from the received data, the system may involve the introduction of external data. In the physical fitness example, such external data might take the form of national statistical data. In any event, the processing operation usually involves comparison testing which compares caller data from individual memory cells of the processors P1-Pn (FIG. 1) with test data that is supplied through the command terminal CT.

In the above example, members of the public in general were invited to use the service. A number of alternatives exist which might well impact on the statistical analysis. For example, a list may be preserved by a use-rate calculator to implement a consumable key operation. That is, a user is qualified to a specific limited number of uses during a defined interval.

As another example, callers might be restricted to the purchasers of a specific product as a medical apparatus for measuring blood pressures, heart rates, or so on. In such situations, it will be apparent that the statistical data will be somewhat distorted from an average or normal sampling. Clearly, the processors P1-Pn can be programmed to take into account such considerations. In that regard, the processors might also verify identification data proffered by a caller. Such data might take the form of a credit card number or a personal identification number. Methods for verification of such numbers using computer techniques are discussed below.

As indicated above and detailed below, the system can be programmed or formatted for use in a variety of applications. Preliminary to considering exemplary forms of such applications, reference will now be made to FIG. 4 showing an exemplary structural form for the processors PR1-PRn. From the switch 21 (FIG. 1) a pair of communication lines 90 and 91 are indicated in FIG. 4 (top left). The line 90 provides signals from a processing unit 92 while the line 91 provides signals to the processing unit 92 along with other components as represented in FIG. 4. The separate lines 90 and 92 facilitate explanation.

The processing unit 92 may take the form of a mini-computer programmed to accommodate the functions of various applications, as disclosed in detail below. As indicated above, the system may utilize a plurality of independent function units or processing units, e.g., processing unit 92, operating in a somewhat parallel configuration, or alternatively, a limited number of processors may be driven sequentially to accommodate the functional operations as described.

The input line 91 (upper left) is connected specifically to a qualification unit 93, a sequencer 94 and a designation unit 96, as well as the processing unit 92 as indicated above. The qualification unit qualifies access from a remote terminal

10

T1-Tn to the processing unit 92 as described in detail below. In accordance with various applications or operating formats, the qualification unit 93, the sequencer 94 and the designation unit 96 operate preliminarily with respect to individual callers. Generally, these units qualify or test callers for entitlement, develop a sequence-of-calls record and provide forms of designations for callers that may be authenticated. As described in detail below, the units function in sequence to accomplish such operations and accordingly are each individually connected to the processing unit 92 and a buffer storage 97. Essentially, the buffer storage 97 is illustrated separately from the processing unit 92 along with the unit 93, sequencer 94, unit 96, and so on, again in order to facilitate the explanation. Similarly illustrated are a memory 98 (with cells C1-Cn), a look-up table 103 and a clock 105.

Considering the processor of FIG. 4 in further detail, the qualification unit 93 (upper left) is connected to a look-up table 99 and a use-rate calculator 100. The designation unit 96 (top center) is connected to a random number generator 101 and an encryptor 102.

In view of the above structural description of the system, consideration will now be given to certain specific applications in relation to the operation of the system. In that regard, the operation of the system will next be considered to automate a mail-order facility.

Assume that a caller at a terminal T1 (FIG. 1) dials a specific number to identify a mail order interface with the system of FIG. 1. For example, assume the telephone number "(213) 627-4444" for such an interface. Accordingly the caller dials the number at the remote terminal T1. As a result, the communication facility C couples the terminal T1 through the automatic call distributor AC1, the interface 20 and the switch 21 to a select processor PR1 identified and programmed for a mail-order operating format. Note that the communication facility C provides the dialed number ("(213) 627-4444") to the processing system P1 through well known telephonic equipment DNIS. Accordingly, a program is selected to execute the mail order interface.

As a preliminary action, a voice responder in the interface 20 might be cued by the processing unit to identify the mail-order house and indicate that the order will be taken by computer. Either before or after qualification, the caller might be advised that if he prefers to communicate directly with a person, or needs such contact at any point in the communication, he may accomplish it simply by pushing the asterisk button (*) at the terminal T1. Such action forms an abort signal that is detected by the processing unit 92 to transfer the communication to the interface terminal IT (FIG. 1). Alternatively, the customer may be asked (by voice cue) to provide detailed information as name, address, etc. which is recorded for later processing.

After the preliminary information is supplied to a caller, the qualification phase is initiated. For example, the interface 20 might actuate the terminal T1 to announce: "Please indicate the type of credit card you will use for your purchase by pushing the button number 'one' for Mastercharge, 'two' for"

The caller's response, indicating a specific credit card, will be stored in a data cell; however, the data is developed initially in the buffer 97. The format and data for the present example (in the buffer 97) will be explained with reference to a storage block format 104 as illustrated in FIG. 5. The first data block 130 accordingly registers a digit to indicate the card that will be used to support the caller's purchase.

Using voice prompt, the interface 20 next instructs the caller to use the telephone buttons to indicate his credit card

5,815,551

11

number and the expiration date of the card. That data is stored in the register **104**, specifically in the blocks **132** and **134** as illustrated in FIG. 5.

Next, the caller is asked for his customer number, as it may appear on his catalog. That number is stored in a block **136** of the block format register **104**. Note that the caller may not be identified in the files of the mail-order house and in that event, the operation may be shifted to a manual operation to be continued through the interface terminal IT (FIG. 1) as explained above. For a television-initiated mail-order transaction, other numerical codes might be employed as to key into broadcast schedules. For example, a code might be used to indicate program times and thereby enable evaluation of the productivity of such program times. Such operation may be performed during the designation phase as described below.

To continue with the explanation of the automated format, assume that the customer has a file customer number and that it is stored in the block format register **104** along with his credit card number and expiration date. From that location, the data is checked by the qualification unit **93** (FIG. 4) for propriety as part of the test or qualification phase of operation. The check or test is in two stages and both are performed during an interval designated **t1**, the qualification unit **93** operating under control of the processing unit **92**.

First, the data is verified as representing valid and proper data formats for the customer's number, the credit card number and expiration date. The second operation involves consulting a so-called negative list to assure that the identified card and customer's number have not been cancelled, as for example in the case of credit cards that have been lost or stolen. Detailed structure for such tests is described in the parent case from which this case continues and may be incorporated in the qualification unit **93**.

With the successful completion and verification of the preliminary data in the block format register **104**, the qualification phase of operation is concluded and the system next interfaces with the caller to acquire and process data for a specific order of merchandise. Note that in the mail-order operating format, the sequence of the call is not normally significant. However, the sequencer **94** may log the time during a period **t2** if deemed worthwhile.

Somewhat as described above in relation to the initial operating format (health poll), the voice generator in the interface **20** prompts the caller through a series of exchanges that load the storage block format register **104** with a merchandise order. Thus, as purchase items are confirmed, the register **104** is loaded as exemplified by the blocks **140** and **142**. The interchange continues until the customer indicates he does not wish to order any additional items. The system then operates the designation unit **96** (FIG. 4) during the interval **t3** to develop and announce the acknowledgement digits as stored in the block **144** (FIG. 5). The acknowledgement digits serve to identify the order both for the caller and the mail-order house. Accordingly, tracing is facilitated. The data (FIG. 5) is then transferred from the buffer **97** (FIG. 4) to a select memory cell **C1-Cn**.

During the next interval **t4**, the processing unit **92** (FIG. 4) isolates data of the cells **C1-Cn** to facilitate the mail-order process. In that regard, the processor **92** may incorporate structure and processing techniques as disclosed in the parent case.

Of the wide variety of other operating formats and applications in accordance herewith, further examples will now be described with reference to the systems of FIGS. 1 and 4. However, from a consideration of the operating formats treated below, it will be apparent that certain structural

12

elements have reoccurring significance in the combination. Specifically, such elements include the structures: (1) utilizing the called number to select a specific operating format, (2) for screening or selecting callers who will be accepted based on various criteria, (3) for designating callers in a manner to enable subsequent positive identification and (4) various processing aspects of the data manipulations including the provision of at least a portion of certain ID data provided directly from the telephone apparatus. With respect to the data processing, distinctive elemental features include the utilization of external data not available during the interval of gathering data, the utilization of an interrelationship between the composite data collected during a data acquisition period, and the operation of utilizing time or sequence of callers to accomplish a subset.

As the next illustrative operating format, an instant lottery system will be described. Accordingly, assume the existence of a legalized state lottery accommodated by the telephone system utilizing a pay-to-dial number ("(213) 976-xxxx") and restricted to a limited number of uses for defined intervals of time. For example, a person might be entitled to play the lottery a limited number of times or to the extent of a limited dollar value during a predetermined interval.

From the terminal **T1** (FIG. 1) the caller would actuate the push buttons **14** to establish contact with the processing system **P1** coupling would be through the communication facility **C**, the automatic call distributor **AC1**, the interface **20** and the switch **21** as described in detail above. The initial operation then involves qualification of the caller to participate in the instant winner lottery. Again, ANI or caller interface techniques may be employed. If the caller is involved, the interface **20** is actuated by the qualification unit **93** during the operating interval **t1** to instruct the caller: "Please key in your telephone calling number". As indicated above, an alternative involves the system simply registering the calling number on the basis of its provision by ANI equipment.

In any event, after the caller's telephone number is registered, the instruction is given: "Participation in instant winner lottery is for persons over twenty-one years of age. Accordingly, please key in the year of your birth". A driver's license or credit card number may be similarly registered to confirm age. Alternatively, the combination of telephone number and date of birth could be used. In any event, the caller's data is registered and the qualification unit **93** then functions to test the data as provided. Specifically, the caller's telephone number is checked in a look-up table **99** to determine whether or not it is a proper and currently valid number for use in the lottery. Concurrently, the number is checked by the use-rate calculator to determine the number of times it has been used in excess of a predetermined number of calls or dollar value to participate in the lottery during a current interval of monitoring.

If the data indicates a qualified caller, the system proceeds to the next phase of designating the transaction. Note that the sequence is not significant in this operating format with the consequence that the interval **t2** and the operation of the sequencer **94** may be bypassed. Rather, the designation unit **96** operates during the interval **t3** to provide the caller with a designation for the current transaction and if applicable, updates the file as to current use or dollar value remaining for the caller's use. As explained above, the random generator **101** with or without the encryptor **102** may be employed to create an identification number which may include an encrypted form of the caller's telephone number. Accordingly, data for the transaction is established in the buffer **97** then set in a cell of the memory **98** (FIG. 4).

5,815,551

13

Specifically, the completed data cell format might be as follows: Telephone No.-Birth Year-Designation-Random No.

The system next functions to generate the random number as indicated above which will then be tested against a series of other numbers to determine whether or not the caller is a winner. In that regard, elements in the processing unit **92** which accomplish the operation are illustrated in FIG. **6** which will now be considered in detail.

A random number generator **160** functions on command to provide a three-digit number. With the consummation of a call, the random number generator **160** is actuated to provide the caller's random number in a selected caller cell **162**. From that location, the caller's random number is compared with numbers from a register **164** by a comparator **166**. The numbers in the register **164** were previously passed through a gate **174** from the generator **160**. In the event of coincidence, the comparator provides an output "yes" signal to a line **168**. Conversely, the failure of coincidence prompts the comparator **166** to provide a "no" output to a line **170**. Essentially, a "yes" indicates a win while a "no" indicates the caller has lost.

The elements of FIG. **6** provide a random operating format to determine winners on a somewhat statistical basis; however, the system increases the probability with the passage of time when no win occurs. In that regard, at the outset of an operating cycle, the random number generator **160** provides a random number that is passed through the gate **174** to the register **164**. In the exemplary format, a three-digit number would be provided. At that stage, the caller's random number, from the cell **162**, would be compared with the single number in the register **164** by the comparator **166**. However, with the passage of time, calls are tallied or time is metered by a counter **178**. Accordingly, upon the attainment of a predetermined count, the gate **174** is again qualified to enter another number in the register **164**. Accordingly, an increasing set of numbers are held in the register **164** for comparison with each caller's number. Of course, the more numbers in the register **164**, the higher probability of a caller winning and that relationship depends upon the duration or number of calls since the last winner.

Either a win or a loss as indicated within the processing unit **92** (FIG. **4**) prompts the interface **20** to respond appropriately to the caller announcing his results. If there is a win, the designation may be reinforced and additional identification may be taken as explained above. Of course, if the prize simply involves a credit on the caller's telephone bill or his credit account, identification and designation become less critical considerations.

In the event of substantial awards to be claimed, the processing system **P1** (FIG. **1**) may actuate the printer **PR** to produce a positive identification of the winner, which document may be redeemed only by the caller providing the assigned designation along with confirmation of his identification data.

Generally in relation to awards, the processing unit **92** may also utilize a random number format for determining the significance of awards. That is, a random number may be actuated to provide numerals from one through twenty, for example, the magnitude of the number generated for a caller indicating the significance of his award. Normally such information would be provided to the caller and registered in his memory cell.

With respect to memory cells generally, it is to be noted that actuated memory cells may be cleared for callers who are not winners. Accordingly, a limited number of memory cells store the subset of winners for subsequent confirmation processing and so on.

14

As another operating process format in accordance with the present invention, consider an auction sale. As disclosed herein, the auction format is associated with television as, for example, in the form of a cable channel for dedicated use during an interval of an auction sale.

Preliminarily, in accordance with the disclosed exemplary format, persons wishing to participate in the auction sale would make preliminary arrangements involving utilization of the system to establish authorization data for qualified bidders in cells **C1**–**Cn** of the memory **98** (FIG. **4**). In an alternative format, the bidders could simply be qualified immediately before bidding, as on the basis of a charge-card number or other identification.

Generally, it is contemplated that callers are coupled into the system only during the bidding on specific items of merchandise. Accordingly, some prequalification may be desirable to facilitate the rapid accumulation of a bidding group with the introduction of a unit of merchandise.

In accordance with the disclosed format, an auctioneer conducts the sale in a somewhat traditional manner, recognizing that he is interfacing a relatively large audience through the system of the present invention and with a television connection. Specifically, the auctioneer is cued as to audience reaction by a monitor incorporated in the command computer terminal **CT** (FIG. **1**). Essentially, the auctioneer is given an abstract or summary of the relative bidding as the auction progresses. In one format, the caller sees the auction on a television receiver. That is, the monitor may be covered by a television camera to inform the audience and particularly interested bidders. Consider the detailed steps of the operation.

As the auctioneer announces the next item for sale, it is televised to potentially interested bidders. In addition to being informed of the merchandise, potential bidders might also be reminded of the telephone number for participating in the auction. Accordingly, any interested person at a remote terminal **T1**–**Tn** may dial the auction number and obtain access to the processing systems **P1**–**Pn**. The caller would have a television set available, tuned for example to a cable channel.

Any preliminary qualification as indicated above will then be performed along with any appropriate designation. With regard to the designation, unless callers are identified as part of the qualification step, the designation unit **96** (FIG. **4**) assigns a limited-digit number to individual callers for use by the auctioneer interfacing the command computer and terminal **CT**. Further designation and sequencing as disclosed herein also constitute part of the process. To the extent that qualification and designation operations may be performed, the operations are performed as described above with reference to FIG. **4** by the qualification unit **93** and the designation unit **96**. Of course, any of the safeguards and limitations as described herein may be employed as deemed appropriate for an auction format.

After the preliminaries, the auctioneer initiates the bidding with respect to a particular item that is observed by the callers on a television receiver as through a cable channel. Note that the audio may be variously coordinated through the telephone communication facility **C** and the audio channel of the caller's television. In a simple format, after an introductory phase, communication to callers with respect to the bidding is provided through the television link. Alternatively, the audio unit **AD** (FIG. **1**) may be employed.

Essentially, the auctioneer initiates the bidding by stating an initial value for the opening bid. Callers are invited to bid by actuating the push buttons **14** (FIG. **1**). For example, the auctioneer may invite an initial bid of one hundred dollars

5,815,551

15

asking callers to so bid by entering an asterisk (*) by punching the button so designated. In accordance with one operating format, cells in the memory 98 (FIG. 4) are actuated to register the bidding number in identified relationship with several calls. Note that although a record may be desirable, it is not usually necessary to record all bids, particularly at initial bidding figures. In any event, the individual processing units, e.g. unit 92 in individual processors PR1-PRn are interconnected (FIG. 1) and operate to select the final and key bids.

After attaining the initial bid, the auctioneer may invite further bidding by seeking a bid of two hundred dollars or any bid. Such a bid might be accomplished either by punching the asterisk button to attain the solicited bid, or by using number buttons to enter a different bid, e.g. two hundred fifty by buttons "2", "5" and "0". Again, cells of the memory 98 are actuated to record select bids (sequence) at the higher value.

The status of the bidding is presented to the auctioneer by the monitor of the command computer terminal CT (FIG. 1). Specifically, the auctioneer is provided an indication of the number of bidders at each level. If a sizeable number of callers bid at a specific value, the auctioneer may wish to advance the price significantly for the next round of bidding. Thus, the auctioneer proceeds until a small group of remaining callers are addressed. Note that the display of the command terminal CT (FIG. 1) may also inform the auctioneer of fresh bidders.

As the selection process proceeds, signals from the clock CL (FIG. 1) are introduced to indicate the sequence of bidders. For example, assume the bidding has proceeded to a stage where only three bidders remain active. The auctioneer is informed by the command terminal CT of the order in which the callers made their bids. The sequence is also of record in the cells of the memory 78 (FIG. 4) to indicate the sequence in the event that the final bid involves more than one caller. Of course, the first caller to respond with a bid would have priority in the purchase.

Normally at the conclusion of the bidding on a particular item, the contents of the cells in the memory 98 would be purged with only the final bidders being held in general memory within the processing unit 92. Of course, it is important to maintain a record of back-up bidders in the event the sale is not consummated with respect to the first of the highest bidders. That is, a subset of the highest bidders is preserved for each item of merchandise in the event that the highest bidder fails to qualify or the sale otherwise cannot be consummated. Of course, a distinct advantage of the system is the ability to accommodate a vast auction participation group for items of substantial value and as a consequence the distillation of a subset of callers is exceedingly valuable information.

To consider another operating format in association with the television media, a system will now be described whereby television viewers participate on a real-time basis in a game show for prizes. The ability to involve television viewers in a program has the potential of expanding program interest along with the expanded participation.

Game shows in accordance herewith may take any of a wide variety of forms as several well known programs in which studio contestants compete for prizes. In utilizing the system of the present invention to involve remote participants, it may be desirable to preliminarily qualify and designate callers as explained above. Specifically, prior to participating in an actual game show, interested participants interface the system as depicted in FIG. 1, and in the course of an exchange as described above, the qualification unit 93

16

and the designation unit 96 cooperate with the processing unit 92 to accomplish preliminary data on potential participants in cells of the memory 96.

Various games will involve different screening processes and clearances. For example, a child's television game format may require parental clearance and in that regard written communication may be required for approvals. Such approval may require the assignment of a personal identification number to the child player as qualifying identification data.

As explained above, clearances may be perfected through the look-up table 99 (FIG. 4) in association with the qualification unit 93 or approvals through a consumable key step may be extended to incorporate functions of the processing unit 92 in association with the memory 98. For example, if qualification simply involves a check-off operation, the look-up table 99 will normally be employed. However, in the case of preregistration for a participant, as in the case of the auction sale, the memory 98 is involved with the qualification unit 93 through the processing unit 92 to establish a data cell C1-Cn for each qualified participant. Thus, each potential participant to be qualified interfaces with the processing unit 92 during a preliminary interval of operation to provide data in one of the cells C1-CN to facilitate qualification for participation during a real-time game show.

At the time of the show, callers are qualified simply by reference to their assigned memory cell data for a verification. Thereafter, the caller's exchange information to supplement their data as with respect to the play which follows. Specifically for example, a caller might select a studio audience participant with whom the caller is to be allied. The interface operation may be essentially as described above wherein a voice generator in the interface 20 (FIG. 1) provides signals which activate the remote telephone unit to speak the instruction: "If you wish to play with Player No. 1, please push button No. 1; if you wish to play with Player No. 2, please push button No. 2 . . . and so on". The caller may also be instructed to indicate the extent of a wager. For example, "Push the number button indicating the points you wish to risk".

The participant data is stored in an assigned cell of the memory 98 (FIG. 4) for the caller and as the game proceeds, the processing unit 92 tallies the caller's score. Scores are interrelated between individual processing units to actuate the terminal CT. Thus, individual accounting occurs for each of the calling participants on an on-line basis dependent upon the success of the studio players and their association with the callers. On-going accounting data may be provided at intervals or real time by the recorded voice to each contestant.

According to the described format, after an interval of play, the processing units, as the unit 92 (FIG. 4), operate to isolate a subset of caller-players who have amassed the highest scores. Of course, various arrangements may be provided for awarding prizes to the select subset of winning callers.

The above format involves a real-time game show with an on-line operating format. A somewhat similar format involves nonreal-time operation and in that sense, callers may interface with the system of the present invention before and after the show; however, not primarily during the show. Such a show might involve a quiz for callers based on their ability to perceive and remember occurrences within the show. Preregistration may be employed, however, is not essential. Rather, callers may call after the broadcast of a program. In that event, sequence or time clocking may be

5,815,551

17

very important to limit or control individual interfaces to a specific time or geographic "window". That is, as suggested above, allocation-routing equipment and techniques may be employed in various of the formats to window callers. With the system, callers are screened or qualified at the time of a call, identified in a particular calling sequence, designated for identification and quiz answers are given for subsequent processing. Alternatively, players could participate by providing their credit card for billing or be billed through the "pay-to-dial" network. Consider an exemplary format.

A key to participation in the game show may involve the purchase of a particular product. For example, a person desiring to participate may purchase a product which carries a concealed key number. The number serves as a caller's key to participation in the game show.

In accordance with the disclosed operating format, after watching the broadcast of a television show (possibly a serial episode) the participant actuates the push buttons **14** at one of the remote terminals T1-Tn to accomplish an interface communication with the select operating format. For example, the caller may actuate the buttons **14** for the station number "277-7777" which identifies the game format of current description.

Assume responsive operation of the communication facility C to couple the caller through the automatic call distributor AC1 to the interface **20**.

Upon establishing a connection, the interface **20** receives the caller's telephone number through ANI equipment and a data cell in the memory **98** (FIG. 4) is assigned to the caller. Specifically, for example, associative coupling is provided for the caller through the switch **21** (FIG. 1) to the processor PR1 containing the memory **98** (FIG. 4) and a cell C2 assigned to the caller. A block format **200** is illustrated in FIG. 7 indicating the data that is developed in the cell C2. At the outset, the caller's telephone number is stored in a section **201** followed by uses/month in section **202**.

Next, the caller is greeted and requested to give the key number entitling him-to participate in the game show. The instruction constitutes an initial action to take place in an interval of qualification during the time t1. The caller actuates the buttons **14** providing digital representations to the qualification unit **93** (FIG. 4) and the look-up table **99** is consulted. Note that the table **99** may be a large, shared unit that tabulates each of the key numbers and accounts for their use. If the caller has identified a proper key number, the process proceeds and the key number is accounted, i.e. incremented or decremented to the limit of use if any. Alternatively, a repeat information operation may be requested as described in detail above.

As a further check during the qualification stage, the use-rate calculator **100** may function to determine whether or not an excessive number of calls have originated from the designated number. Thus, consideration involves calls or value with reference to a predetermined period of time. Again, a shared calculator may be used or addressing may obtain selectivity on the basis of calling numbers. If a large number of calls have originated from a single telephone terminal, a fraudulent situation may be suggested. Assuming no such indication occurs, the number of uses is registered in a section **200** (FIG. 7) and the operation proceeds from the interval t1 to interval t2.

During the interval t2, the sequencer **94** registers the precise time of the call in the buffer storage **97**, specifically in a section **204** as illustrated in FIG. 7. With the entry of such data, the system passes from the operating interval t2 to t3.

The caller is next asked to identify himself in some specific manner. For example, the caller may simply be

18

asked to provide the year of his birth. Alternatively, somewhat comprehensive information may be taken as in the form of drivers' license numbers, social security numbers and so on. Of course, such data may be employed for subsequent identification of the caller and, accordingly, is registered in the buffer storage **97** (FIG. 4). Specifically, identification information is registered in section **206** of the block **200** as shown in FIG. 7.

In addition to receiving identification information from a caller, the system assigns a designation to the caller: Specifically, the random number generator **101** (FIG. 4) provides a number which may be encrypted along with other identification data as the caller's personal identification to provide a numerical designation that is registered in the storage **97**. Specifically, the designation is stored in a section **208** as illustrated in FIG. 7. With the designation operation complete, the interval t3 terminates initiating the data accumulation phase which occurs during an operating interval t4.

At this juncture, operating elements within the processing unit **92** will be considered in relation to an explanation of the manner in which select questions are provided to a caller and his answers received and recorded for subsequent processing to determine winners.

Preliminarily, reference will be made to FIG. 8 showing elements involved in the operating format which are contained in the processing unit **92** (FIG. 4) in association with the memory **98**. To avoid confusion, the elements identified in FIG. 8 are designated by fresh numerals.

To accommodate the exemplary operating format, a dramatic program might be recorded preparatory to the television broadcast. A substantial number of questions would then be formulated based on the dramatic program. For example, "How many people were present when the will was read?"

It is contemplated that the dramatic program would be broadcast to different geographical segments of the country during different time intervals. To accommodate the different time intervals, it is proposed to utilize different questions for each geographic segment. That is, the basic format can remain the same, only the questions change by time zone to avoid study and collaboration on questions as a result of time shifts. A question propounded to a Chicago caller should not be repeated to a Los Angeles caller. In any event, callers might be given three questions randomly drawn from a pool serving one geographic segment and three questions drawn from a different pool serving another geographic segment.

The signals for prompting a voice generator are registered in memory sections MS1 through MSn. Each of the memory sections MS1-MSn is served by an address input AI1-AIn respectively. Similarly, the address inputs AI1-AIn are instructed by random number generators NG1-NGn, in turn actuated by decoders DE1-DEn. Consider the operating sequence of the memory MS1 as an example.

The decoder DE1 is responsive to telephone calling numbers (provided by ANI equipment) indicative of a particular geographic area. Note, for example, that area code numbers afford an effective geographic classification of callers which is very useful in many formats or processes of statistical analysis in accordance herewith. Note that geographic (or other) classification in accordance herewith is also accomplished by the called numbers provided. Each of several television stations would solicit calls for different numbers as a result, either by DNIS or call channeling. Select processors would be reached through the interface units, e.g. interface **20** FIG. 1. In operation, the decoder DE1 determines a call is from a specific geographic area and accordingly provides a signal to actuate the random number

5,815,551

19

generator NG1. As a consequence, the random number generator NG1 provides a series of three random numbers in the form of addresses for the memory MS1. That is, the addresses may simply comprise three alphanumeric bits supplied to the address input AI1 to prompt the provision of three sets of voice generator signals for announcing the three questions in sequence. For example, the first question might be as suggested above: "Push the button on your telephone for the number of persons present in the room when the will was read".

The voice generator signals are supplied from the memory MS1 (within the processing unit 92, FIG. 4) to the interface 20 (FIG. 1) which generates audio signals to actuate the caller's hand piece 10. Accordingly, the caller is instructed to answer three questions, the responses being recorded in a section 210 of the data block 200 (FIG. 7). Note that the clock 105 (FIG. 4) may be utilized to limit the response period allowed each caller.

As indicated above, to accommodate broadcast of the program in a different time slot for a different geographic area, the decoder DEN (FIG. 8) actuates the random number generator NGn to address the memory MSn to provide three different questions as a result of a random selection. Accordingly, within a time or times (perhaps limited and offset) after the conclusion of the program, a substantial number of callers are accounted for in cells of the memory 98 and similar units of the composite system. The cells indicate sequences of calling and also may contain billing data where appropriate. That is, pay-to-dial operations avoid the need for billing, yet it may still be made of record.

Subsequent to the data accumulation phase of operation, the processing unit 92 (and its equivalents) is actuated during an off-line processing interval to isolate the subset of callers correctly responding to the questions. In accordance with one format, the subset of successful callers may be reduced to a sub-subset as by a random computer "draw" to define a group of significant winners. That is, a random number generator may be employed as explained above.

As an alternative to subsequent processing, the system may inform callers of their success during the course of the interface telephone call. That is, callers might simply be informed by cuing the voice generator: "Your answers are correct and in accordance with the program game, you will now be entered in the sweepstakes draw for the prize" Thus, the format defines a subset then further selects a sub-subset of winners. In any of the various formats, the status of the analysis can be televised by selecting a camera focused on the interface terminal IT.

Still another operating format for the system takes the form of polling operations to determine opinion or facts. An illustrative form of the format is disclosed below again in association with a television broadcast.

Generally, the illustrative polling format is contemplated in association with a television broadcast addressing a matter of current interest as, for example, a political issue or election. A master of ceremonies propounds questions to a viewing audience, many of whom are on-line through an interface of a system of the present invention. The master of ceremonies or commentator instructs the callers who are regulated and controlled by the system of the present invention to provide digital data which the system processes to inform the commentator as with regard to subsets of callers. For example, the commentator may be statistically informed as to the numbers of callers holding specific views. Consider a specific exemplary operating format.

Assume the existence of a system in accordance with the present invention installed for use in association with a

20

television broadcasting facility. Of course, various previous arrangements could be involved; however, according to one arrangement a commentator simply invites members of the viewing audience to call a specific number and express their views with respect to a specific issue. Callers located at terminals T1-Tn (FIG. 1) activate the terminals to accomplish an interface with one of the processing systems P1-Pn as explained above. Note that the processor (or the interface 20 may involve operation of the qualification unit 93 (FIG. 4) to prevent callers from loading the poll. That is, to prevent multiple calls from a single terminal that would distort a poll, the qualification unit 93 registers calls in association with the use-rate calculator 100. Interfacing a specific processor, callers are screened by the qualification unit 93 (FIG. 4). In such a poll, it may be important to control the sampling group on a statistical basis. For example, it may be desirable to limit callers from each of several geographic areas. Accordingly, by the use of ANI equipment, the caller's telephone number is provided to the qualification unit 93 during the preliminary interval t1, and a determination is performed with regard to the number of involved callers from the geographic area using the look-up table 99. On attaining a full quota from a specific area, a subsequent caller may be informed that the lines are full. Alternatively, the caller may be requested to provide his telephone number for screening in the event ANI equipment is not available.

The caller may be requested to provide additional information so as to poll a balanced group. For example, a caller might be asked questions concerning age, political registration and so on by prompting the interface unit 20 to pose audio questions and testing the digital results through the qualification unit 93 as with reference to the look-up table 99.

As indicated above, in the event that the broadcast television program is one of a series, it may be desirable to limit the extent of participation over a period of several programs. Accordingly, the use-rate calculator 100 (FIG. 4) may be employed in association with the qualification unit 93. That is, if a calling number has participated in a prior poll, it may be denied access for a subsequent poll or its data not counted. Such operation would involve the use-rate calculator 100 in association with the qualification unit 93 performing logic tests to actuate the voice generator of the interface 20 for providing an appropriate interchange with a caller.

With the screening or qualification of a select group of callers, the sequencer 94 (FIG. 4) may or may not be involved to identify the order of callers. Also, the designation unit 96 may or may not be involved in view of the fact that for many polls there is little interest in subsequently identifying callers.

In the poll-format operation of the system, it is important to provide a capability of defining select intervals during which callers may provide data. In one arrangement, with the consummation of a communication interface between a caller and a processor unit, the audio of the television broadcast is keyed from the audio unit AD through the switch 21 (FIG. 1) for communication to the caller.

With a multiplicity of callers in interface relationship with the processors P1-PRn as function units, a polling question is stated, for example: "If you favor expanded trade with . . . at the tone press button one; if you do not, press button two".

To control the interval of polling, the command computer terminal CT (FIG. 1) is actuated to enable the callers timely access to the processors.

At the expiration of a polling interval, the interfaces may be terminated or additional questions may be propounded. In

5,815,551

21

any event, subsequent to the data-gathering phase, the bulk data is supplied to the command computer terminal CT incorporating computing facility to isolate subsets for communication by the broadcast. Accordingly, an effective on-line poll can be conducted with statistical sampling control and prompt display of responses.

As explained above, the arrangement of the function unit (or units) may be variously embodied in a single processor or many processors, depending on various considerations as time sharing, multiplexing, paralleling and so on. The systems as described above embody the components bulked together in one location. However, components of the system could be spaced apart geographically, using dedicated lines or polling techniques. An illustrative embodiment is shown in FIG. 9.

Call distributors CD1-CDn are at different geographic locations along with associated interface units IA1-IA n and IB1-IBn. Each of the interface units, as unit IA1 is coupled to a central processor 251 as indicated by lines 252, 254, 256 and 258. Each of the lines may take the form of a dedicated telephone line or a polling telephonic coupling.

In the operation of the system of FIG. 9, the call distributors CD are coupled to a telephonic communication system and accordingly allow the interface units I to provide interface communication between the central processing unit 251 and a multitude of remote terminals T1-Tn as illustrated in FIG. 1. With data accumulated in the cells, it may be variously down loaded as to a central processing station. Thus, the distributed-component system is capable of executing the various formats as explained above with reference to the illustrative structure.

In view of the above explanation of exemplary systems, it will be appreciated that other embodiments of the present invention may be employed in many applications to accumulate statistical data, process such data, and define subsets of callers of concern. While certain exemplary operations have been stated herein, and certain detailed structures have been disclosed, the appropriate scope hereof is deemed to be in accordance with the claims as set forth below.

What is claimed is:

1. A system to be utilized with a telephone facility for on-line handling of customer data contained in a memory in accordance with a select operating format comprising:

a plurality of call distributors for routing calls based upon availability wherein said plurality of call distributors are located at different geographic locations, said plurality of call distributors receiving called terminal digital data (DNIS) signals automatically provided by said telephone facility to identify said select operating format from a plurality of distinct operating formats and automatically receiving caller telephone number data from said telephone facility;

an operator terminal for use by a person to communicate through the telephone facility;

interface switching means connected to said plurality of call distributors and said operator terminal for receiving incoming calls routed by said call distributors;

computer means coupled to said interface switching means for connecting an incoming call by a caller to said operator terminal based on a condition, said caller telephone number data being stored in said memory such that said computer means in accordance with said select operating format is capable of accessing said customer data on a selected customer which has a telephone number corresponding to said caller telephone number data automatically provided from said telephone facility, said computer means visually dis-

22

playing said customer data on a selected customer and said operator terminal capable of providing data entries to said memory; and

said customer data on a selected customer contained in memory is updated by incorporating said data entries into said customer data.

2. A system to be utilized with a telephone facility according to claim 1, further comprising:

voice generator structure coupled to said interface switching means for prompting callers to enter digital data.

3. A system to be utilized with a telephone facility according to claim 1, further comprising:

qualification structure coupled to said computer means for testing said customer data.

4. A system to be utilized with a telephone facility according to claim 3, wherein said qualification structure tests a caller provided PIN number.

5. A system to be utilized with a telephone facility according to claim 1, wherein said operator at said operator terminal enters data relating to said caller.

6. A system to be utilized with a telephone facility according to claim 1, wherein said operator terminal is provided with a display of data relating to said select operating format under control of said called terminal digital data (DNIS) signals.

7. A system to be utilized with a telephone facility according to claim 1, wherein said customer data on said selected customer includes data relating to a limit on use.

8. A system to be utilized with a telephone facility according to claim 7, wherein said limit on use specifies a predetermined number of uses.

9. A system to be utilized with a telephone facility according to claim 7, wherein said limit on use specifies a one time only use.

10. A system to be utilized with a telephone facility according to claim 7, wherein said limit on use specifies a use relating to a dollar amount.

11. A system to be utilized with a telephone facility according to claim 7, wherein said customer data on a selected customer includes data based on a specified limit on a number of calls from said caller during specified multiple intervals of time wherein said specified limit is automatically refreshed at the beginning or the end of each of said multiple intervals of time.

12. A system to be utilized with a telephone facility according to claim 7, wherein said limit on use specifies an extent of access.

13. A system according to claim 7, wherein the plurality of call distributors located at the different geographic locations are interconnected to said memory which is centrally located to receive, the customer data entered by said operator terminal and update the customer data.

14. An analysis control system for use with a communication facility including remote terminals for individual callers, wherein each of the remote terminals comprises a telephonic capability including voice communication means and digital input means in the form of an array of alphabetic numeric buttons for providing data, the analysis control system comprising:

interface structure coupled to the communication facility to interface the terminals for voice and digital communication and including structure to provide signals representative of data developed by the terminals;

voice generator structure selectively coupled through the interface structure to the terminals for providing vocal operating instructions to individual callers;

5,815,551

23

record memory connected to the interface structure for updating a file and storing data relating to certain individual callers;

qualification structure to access the record memory to test key number data provided by the individual callers to ensure that the key number data is valid;

generator structure selectively coupled to the interface structure and the record memory for providing computer generated numbers to the individual callers and storing the computer generated numbers in the record memory; and

analysis structure connected to the record memory for processing at least certain of the data relating to certain individual callers subject to qualification by the qualification structure.

15. An analysis control system according to claim 14, wherein said qualification structure further tests the key number data with respect to a predetermined limit on use.

16. An analysis control system according to claim 15, wherein the limit on use relates to a number of times the individual callers are entitled to call.

17. An analysis control system according to claim 15, wherein the limit on use relates to a dollar amount.

18. A control system according to claim 14, further including means to control processing formats of the analysis structure in accordance with signals automatically provided by the communication facility indicative of one of a plurality of called numbers (DNIS).

19. A control system according to claim 18, wherein the data relating to certain individual callers includes calling number identification data for certain individual callers automatically provided by the communication facility.

20. A control system according to claim 14, wherein the computer generated numbers provided to callers are indicative of sequence data.

21. A system to be utilized with a telephone facility for on-line handling of customer data contained in a memory in accordance with a select operating format comprising:

a plurality of call distributors for routing calls wherein said plurality of call distributor are located at different geographic locations;

an operator terminal for use by a person to communicate through the telephone facility;

a plurality of interface switching structures located at different geographic locations and connected to the plurality of call distributors and the operator terminal for receiving incoming calls routed by said plurality of call distributors based on call allocation routing data and for receiving called terminal digital date (DNIS) signals automatically provided by the telephone facility to identify the select operating format from a plurality of operating formats; and

processing means connected to the plurality of interface switching structures for receiving customer number data entered by a caller and for storing the customer number data in a central memory accessed by said plurality of interface switching structures and based on a condition coupling an incoming call to the operator terminal, the processing means visually displaying the customer number data, the operator terminal providing other data entries to the central memory to update data relating to the caller.

22. A process for controlling operations of an interface with a telephone communication system, the process including the steps of:

providing key numbers specifying limits on use to entitle individual callers to access the operations of the interface with the telephone communication system;

24

coupling remote terminals to the interface for providing voice signals to the individual callers;

receiving the key numbers as digital identification data in the form of terminal digital data automatically provided by the telephone communication system for the individual callers and additional data provided from the remote terminals under control of the individual callers;

qualifying the individual callers by testing to determine if the individual callers are entitled to access the operations of the interface by testing the key numbers for the individual callers with stored key numbers to ensure their validity and further testing the key numbers based on the limits on use specified for the individual callers and accordingly providing approval signals for qualified individual callers;

accessing a memory with the key numbers for the individual callers and storing data relating to calls from the individual callers; and

processing at least certain of the additional data responsive to the approval signals.

23. A process according to claim 22, wherein said coupling step includes generating the voice signals for actuating the remote terminals to provide vocal operating instructions to specific individual callers.

24. A process for controlling operations of an interface with a telephone communication system, the process including the steps of:

providing key numbers specifying limits on use to entitle individual callers to access the operations of the interface with the telephone communications system;

coupling remote terminals to the interface for providing voice signals to the individual callers;

receiving the key numbers as digital identification data in the form of terminal digital data automatically provided by the telephone communication system for the individual callers and answer data provided from the remote terminals under control of the individual callers;

qualifying the individual callers by testing to determine if the individual callers are entitled to access the operations of the interface by testing the key numbers for the individual callers with stored key numbers to ensure their validity and testing the key numbers based on the limits on use for the individual callers and accordingly providing approval signals for qualified individual callers;

accessing a memory with the key numbers for the individual callers and storing data relating to calls from the individual callers;

processing at least certain of the answer data responsive to the approval signals; and

providing on-going accounting data to the individual callers, the on-going accounting data for at least one of a plurality of intervals being determined at least in part by the answer data provided by an individual caller during a call and during at least one of the intervals includes real time data provided to the individual caller on-line.

25. A process according to claim 24, wherein one of the limits on use relates to a dollar amount.

26. An analysis control system for use with a communication facility including remote terminals for calls by individual callers, wherein each of the remote terminals comprises a telephonic capability including voice communication means and digital input means in the form of an array of alphabetic numeric buttons for providing data

5,815,551

25

and wherein the communication facility has a capability to automatically provide terminal digital data to indicate a calling number, the analysis control system comprising:

interface structure coupled to the communication facility to interface the remote terminals for voice and digital communication and including means to provide caller data signals representative of data relating to the individual callers developed by the remote terminals and the terminal digital data;

analysis structure for processing the caller data signals; structure for controlling the analysis structure in accordance with the terminal digital data; and

qualification structure to test the terminal digital data based upon a predetermined limit on use and further testing whether a call by one of the individual callers is being made during a limited period of time.

27. An analysis control system according to claim **26**, wherein the limit on use is a limited dollar amount.

28. An analysis control system according to claim **26**, further comprising:

voice generator structure to provide one of the individual callers with on-going accounting data related to the call.

29. An analysis control system according to claim **28**, wherein the on-going accounting data takes into consideration answer data provided by the callers.

26

30. An analysis control system according to claim **26**, wherein said analysis structure assigns sequential transaction number data to identify calls by individual callers.

31. A system according to claim **1**, wherein said telephone facility further comprises call allocation routing to limit or control individual interfaces to a specific time or geographic window.

32. A system according to claim **21**, wherein said processing means controls a limit on access to said select format based on prior use.

33. A system according to claim **21**, wherein said plurality of interface switching structures receive and store calling number identification signals automatically provided by said telephone facility.

34. A system according to claim **33**, wherein said calling number identification signals control at least in part processing of said customer number data entered by said caller.

35. An analysis control system according to claim **26**, wherein said interface structure provides on-going accounting data to the individual callers, the on-going accounting data for at least one of a plurality of intervals being determined at least in part by the answer data provided by one of the individual callers during a call and during at least one of the intervals includes real time data provided to one of the individual callers on-line.

* * * * *

EXHIBIT 8

[11] **Patent Number:** **5,828,734**
[45] **Date of Patent:** ***Oct. 27, 1998**

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5,828,734

Page 2

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Sheet 1 of 2

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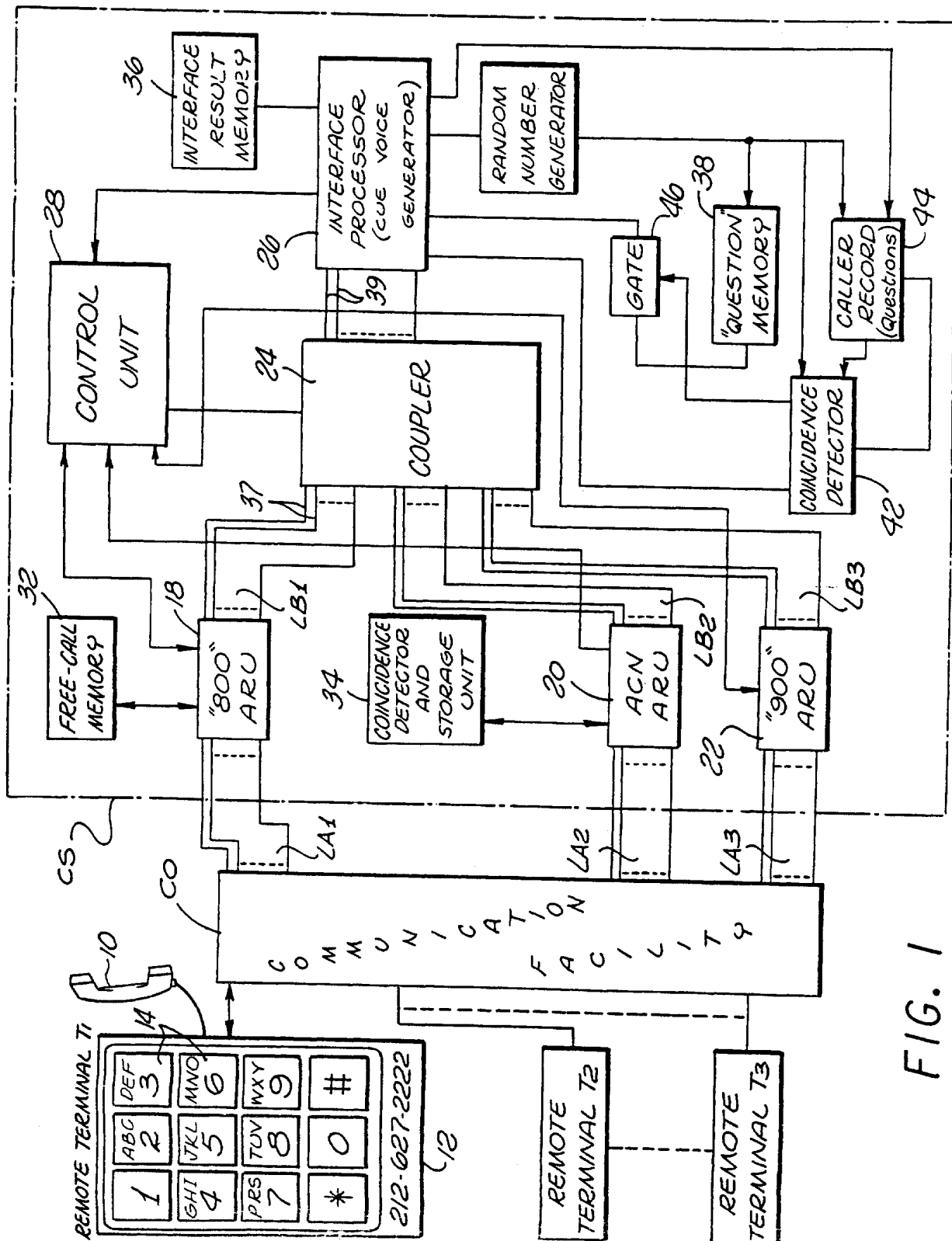


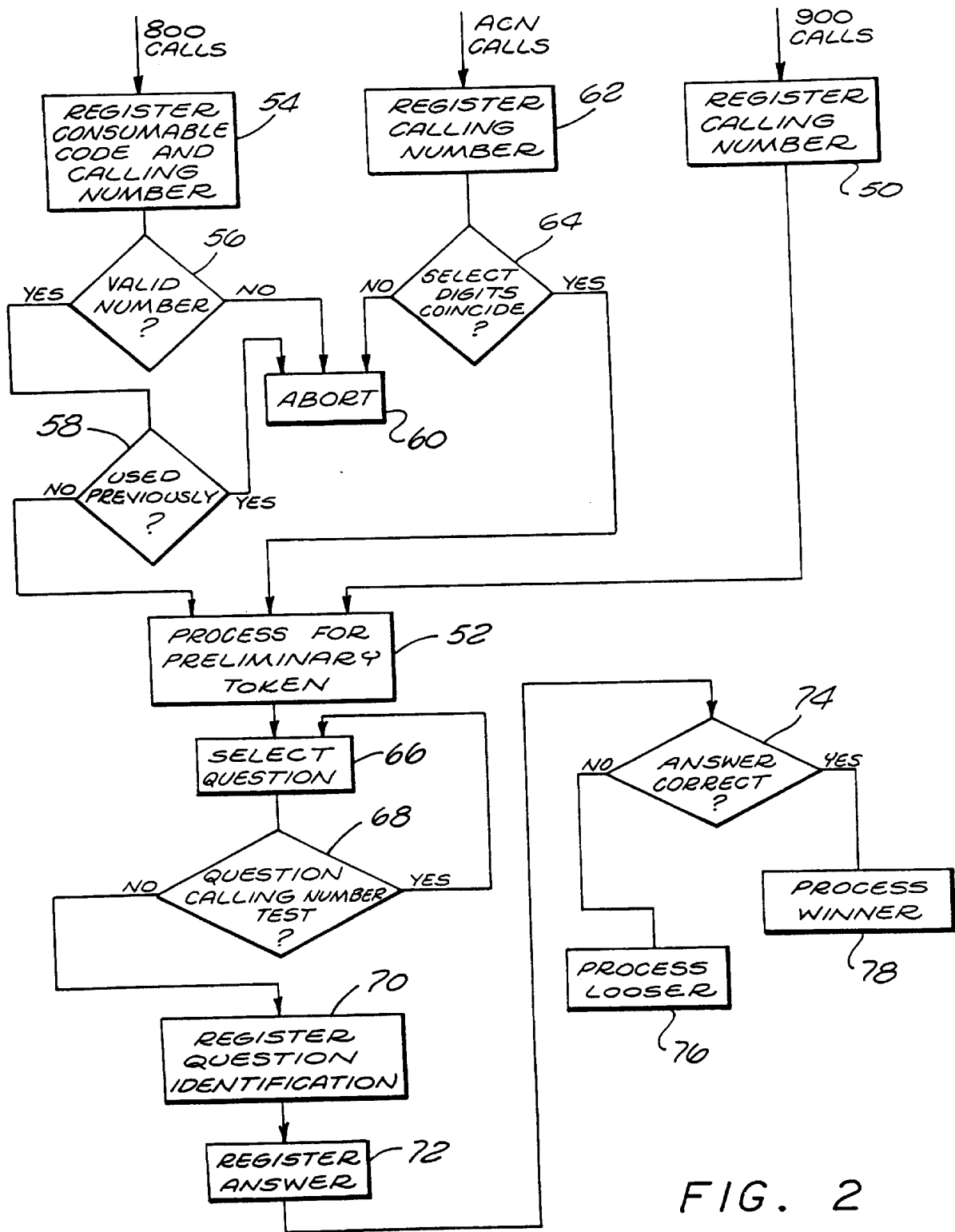
FIG. 1

U.S. Patent

Oct. 27, 1998

Sheet 2 of 2

5,828,734



5,828,734

1

TELEPHONE INTERFACE CALL PROCESSING SYSTEM WITH CALL SELECTIVITY

RELATED SUBJECT MATTER

This is a continuation of application Ser. No. 07/779,762 filed Oct. 21, 1991, and entitled "Telephone Interface Call Processing System With Call Selectivity", now U. S. Pat. No. 5,251,252, which is a continuation of application Ser. No. 07/425,779 filed on Oct. 23, 1989, and entitled "Telephone Interface Call Processing System With Call Selectivity", now U. S. Pat. No. 5,128,984, which is a continuation-in-part of application Ser. No. 312,792 filed Feb. 21, 1989, and entitled "Voice-Data Telephonic Control System", now U. S. Pat. No. 5,703,929, which is a continuation-in-part of application Ser. No. 07/194,258 filed May 16, 1988, and entitled "Telephonic-Interface Statistical Analysis System", now U. S. Pat. No. 4,845,739, which is a continuation-in-part of application Ser. No. 07/018,244 filed Feb. 24, 1987, and entitled "Statistical Analysis System For Use With Public Communication Facility", now U. S. Pat. No. 4,792,968, which is a continuation-in-part of application Ser. No. 06/753,299 filed Jul. 10, 1985, and entitled "Statistical Analysis System For Use With Public Communication Facility", now abandoned. Also, this application is a continuation-in-part of application Ser. No. 07/335,923 filed Apr. 10, 1989, and entitled "Telephonic-Interface Statistical Analysis System", which is a continuation of application Ser. No. 07/194,258 filed May 16, 1988, and entitled "Telephonic-Interface Statistical Analysis System", now U. S. Pat. No. 4,845,739, which is a continuation-in-part of application Ser. No. 07/018,244 filed Feb. 24, 1987, and entitled "Statistical Analysis System For Use With Public Communication Facility", now U. S. Pat. No. 4,792,968, which is a continuation-in-part of application Ser. No. 06/753,299 filed Jul. 10, 1985, and entitled "Statistical Analysis System For Use With Public Communication Facility", now abandoned. The benefit of the earlier filing dates in the United States is claimed under 35 U. S. C. § 120.

BACKGROUND AND SUMMARY OF THE INVENTION

Recent years have seen a considerable growth in the use of telephonic communications. For example, in various applications, telecommunications applications have expanded to accommodate voice-digital interfaces between computer apparatus and callers at remote telephone terminals. For example, by actuating the push buttons at a remote telephone terminal, a caller controls a computer apparatus to provide various entertainment or information. In using such a system, a caller might telephone a financial service and selectively actuate the telephone key panel to receive information on specific stocks or bonds.

Digital interface systems also have been implemented to utilize digital signals provided independently of the caller's actions. For example, the so-called "ANI" telephone equipment provides digital signals indicating a caller's telephone number. Equipment designated "DNIS" is similarly available to indicate the called number. Thus, digital signals may be provided telephonically to a system associated with individual calling terminals as for identification or other use.

Telephonic games and contests are among the various applications that have been recognized for implementation with telephone interface systems. Such games and contests may be variously presented, as in cooperation with an advertising program for a product or in a lottery format.

2

Generally with respect to such applications, various call modes might be utilized.

Essentially, three telephonic calling modes or services are in widespread use. Specifically, caller-charge or "900" service (including "976" calls) involves a charge to the caller for each call. The "900" calling mode is useful for implementing games and contests with telephone interface systems; however, certain problems are encountered. Specifically, certain telephone terminals, e. g. pay phones, do not accommodate "900" service. Also, with respect to certain forms of games and contests, it is important to offer members of the public an alternative "free" method of participation. In general, the system of the present invention may be employed to implement "900" calling modes while accommodating "free" participation with reasonable control.

Telephone calls may be accommodated without charge using "800" service or calling mode. Generally, the "800" calling mode accommodates free calls by callers in various areas to a particular station incurring the charges. In most applications, it is important to regulate the use of the "800" calling mode. Another calling mode is the traditional method of calling, involving area-code numbers which also includes calls placed within a given area code which do not usually involve a specific charge and usually do not require dialing the area code. One of the problems associated with using the area-code calling mode for interface systems is the vast number of calls. For example, even in association with an advertising campaign, inviting members of the general public to participate in a free contest or game by telephone may prompt an overwhelming response. Accordingly, a need exists for a practical system to control and limit calls to an interface service in the traditional free area-code number mode.

Another aspect of telephonic-interface contests involves zealous or obsessive participants. For example, in a quiz contest, a zealous person might call repeatedly, researching answers to given questions until ultimately a question is repeated. At that time, the caller is ready with an answer and has an unfair advantage in the contest. Thus, a need exists for control within the interface system.

In general, the system of the present invention involves a telephone call processing system for receiving calls from a multitude of terminals in different call modes and for processing calls, as to a game or contest format, with means to limit repeat-call advantages. In a disclosed form, the system implements three calling modes to facilitate various formats while accomplishing certain protection both with regard to the calling mode and contest formats.

BRIEF DESCRIPTION OF THE DRAWINGS

In the drawings, which constitute a part of this specification, exemplary embodiments exhibiting various objectives and features hereof are set forth, specifically:

FIG. 1 is a block diagram of a system constructed in accordance with the present invention; and

FIG. 2 is a flow diagram of an operating format of the system of FIG. 1.

DESCRIPTION OF THE ILLUSTRATIVE EMBODIMENTS

As required, a detailed illustrative embodiment of the present invention is disclosed herein. However, telephone techniques, physical communication systems, data formats and operating structures in accordance with the present

5,828,734

3

invention may be embodied in a wide variety of forms and modes, some of which may be quite different from those of the disclosed embodiment. Consequently, the specific structural and functional details disclosed herein are merely representative, yet in that regard, they are deemed to afford the best embodiment for purposes of disclosure and to provide a basis for the claims herein which define the scope of the present invention.

Referring initially to FIG. 1, a series of remote terminals T1-TN (telephone instruments) are represented (left). The terminals T1-TN may be functionally similar and accordingly only the terminal T1 is shown in any detail. The indicated terminals T1-TN represent the multitude of telephone terminals existing in association with a communication facility CO which may comprise a comprehensive public telephone network.

The communication facility CO, accommodating the individual terminals T1-TN, is coupled to a central processing station CS generally indicated within a dashed-line block. In the station CS, to illustrate operating aspects of the present invention, calls are selectively accepted and interfaced so as to accomplish a desired operating format, for example a contest or game.

Generally, calls from the individual terminals T1-TN might be in any of three modes, i. e. the "800" mode, the "900" mode or the area-code mode (traditional area code plus number or local number dialing). In the disclosed illustrative system, depending on individual calling modes, calls are selectively accepted for interface processing. Generally, the interface format accommodates "900" calls with supplemental "800" calls to accommodate both "free" access and all types of telephone terminals. In the disclosed embodiment, calls in the "800" mode are restricted in accordance with prearranged limitations. Furthermore, calls in the area-code mode (from all areas), the 800 mode and 900 mode may be limited to callers having a station number containing a predetermined digit sequence. For example, calls might be restricted to those from terminals having a telephone number ending in the digits "234".

The processing station CS also is controlled to limit the effectiveness of zealous callers. For example, in a contest format, callers may be quizzed with questions randomly drawn from an inventory. In accordance herewith, questions are not repeated to individual telephone terminals T1-TN. Thus, some control is imposed on an aggressive caller who might otherwise be given two opportunities to answer the same question.

Considering the system of FIG. 1 in greater detail, the exemplary telephone terminal T1 includes a handpiece 10 (microphone and earphone) and a panel 12 provided with a rectangular array of individual push buttons 14 in a conventional configuration. Of course, the handpiece 10 accommodates analog signals while the panel 12 is a digital apparatus. During an interface operation, as disclosed in detail below, the caller is queued or prompted vocally through the handpiece 10 (earphone) to provide digital responses using the buttons 14.

At this stage, some specific aspects of the communication interface are noteworthy. Essentially, as a result of telephonic dialing at one of the terminals T1-TN, the communication facility CO couples the select terminal to an audio response unit. Specifically, to illustrate various aspects, three separate audio response units are provided in the station CS to accept calls in the three distinct modes. That is, an audio response unit 18 receives calls in the "800" mode. An audio response unit 20 receives calls in the area-code dialing

4

mode, and an audio response unit 22 receives calls in the "900" dialing mode.

It will be understood that although three separate audio response units are illustrated, systems incorporating the principles of the present invention may well incorporate various numbers of audio response units for each calling mode, with each audio response unit having the capability to accommodate a substantial number of calls as indicated by the lines from the communication facility CO in FIG. 1. Alternatively, a single composite unit might be utilized. Also, the mode or aspects of the described embodiment might well be implemented singly or in various combinations. Herein, for purposes of explanation, calls are treated individually and processed accordingly through the three audio response units 18, 20 and 22.

Generally, the audio response units 18, 20 and 22 connect callers at remote terminals T1-TN from the communication facility CO through a coupler 24 (FIG. 1, station CS, center) to an interface processor 26. Both the coupler 24 and the processor 26 are connected to a control unit 28 that is also connected to the audio response units 18, 20 and 22. Accordingly, with overall supervision by the control unit 28, the audio response units 18, 20 and 22 answer and preliminarily qualify callers from the terminals T1-TN for connection through the coupler 24 to the interface processor 26.

Upon completion of an interface connection in the disclosed embodiment, a contest format is executed by vocally prompting callers to respond with digital data. At this point, it is noteworthy that the communication facility CO also provides identification signals to the audio response units 18, 20 and 22. Specifically, digital identification signals representing numbers associated with the calling terminals T1-TN are provided by "ANI" equipment independent of any action by the caller. In the event "ANI" equipment is not available, callers may be vocally prompted to provide the digital representations by selectively depressing the buttons 14.

The telephone communication facility CO also may provide digital signals indicating the called number. Generally, such a capability involves equipment designated "DNIS". The capability may be useful in various embodiments of the present system, as to distribute calls from a single equipment as mentioned above.

Pursuing the exemplary structure of FIG. 1 in still greater detail, the communication facility CO provides three sets of trunks or lines LA1, LA2 and LA3 respectively coupled to the audio response units 18, 20 and 22. From the audio response units 18, 20 and 22, sets of lines LB1, LB2 and LB3 are connected to the coupler 24. Under control of the control unit 28, the coupler 24 connects individual lines 37 of the sets LB1, LB2 and LB3 to the processor 26 through lines 39.

Generally, the audio response units 18, 20 and 22 may take the form of well known telephonic structures with the capability to "answer" calls and interface callers in a preliminary way. Each of the units 18, 20 and 22 incorporate a voice generator along with some basic programmable logic capability.

The audio response unit 18 is coupled to a free-call memory 32. Generally, the unit 18 in cooperation with the memory 32 operates with the control unit 28 to qualify acceptable calls in the "800" mode.

The audio response unit 20 is connected to a select-number coincidence detector 34. These structures along with the control unit 28 test area-code mode calls. The audio response unit 22 accepts calls without initial qualification.

5,828,734

5

The system of the disclosed embodiment selectively qualifies callers depending on their calling mode. Additionally, the system responds to caller identification to enhance contest equity. Generally, the interface processor 26 poses questions to calling contestants and stores the resulting answers in a result memory 36. Questions given to contestants are selected from a memory 38 by a random number generator 40. Essentially, the memory 38 contains an inventory of questions addressable by numbers provided by the random number generator 40. The address numbers from the generator 40 are also supplied to a coincidence detector 42 that also receives the address numerals of questions previously presented to a specific caller from a record 44. Thus, before a question is presented to a caller, the number of the calling terminal is checked to assure that the same question has not previously been posed to a caller at that terminal.

If the coincidence detector 42 clears the current question as not being repetitive, a gate 46 is qualified and the question is supplied from the memory 30 to the interface processor 26. A voice generator within the interface processor 26 then provides signals through a designated line 39, the coupler 24, a line 37, one of the audio response units and the communication facility CO to the connected remote terminal. As a result, the caller hears a simulated voice question. The answer is provided by the caller actuating the buttons 14 at the calling terminal. In that regard, the question may be in a multiple choice or true-false format to accommodate simple push button actions at the terminal.

In view of the above description of structural elements in the disclosed embodiment, a comprehensive understanding of the system may now best be accomplished by assuming certain operating conditions and describing the resulting operations. Accordingly, assume that the system CS is programmed to accommodate a relatively simple game format, that is, a sponsored contest for the promotion of a product, e. g. the XYZ Widget. Further assume the contest is of limited participation based either upon: the payment of a token fee ("900" calling mode), prearranged participation ("800" calling mode), lottery selection (area-code calling mode) or lottery selection in combination with either 800 or 900 calling modes. Considering exemplary possibilities of the format, the XYZ Widget might be advertised with an invitation to participate via the "900" calling mode. Alternatively, participants might be variously qualified as by select notification; however, in the exemplary format, such participants would incur a token charge imposed through "900" telephonic service. To consider an example, an offering might be stated: "If your last three phone digits are 972 you may call, 1) if you wish, call 1 900 XXXX972 (\$0.95 service charge) provided your last three phone digits are 972; 2) if you have written in for a 'free to enter' you can use the one-time PIN number provided your last three phone digits are 972. In this case you can use the 'free' 800 number provided to you with your PIN number."

As indicated above, some telephone terminals do not accommodate "900" calling mode. Also, under certain circumstances, it is important to afford members of the public "free" access to participate in various games or contests. For example, such participation might be arranged by mail or other communication to provide a participant with a limited-use (i. e. one) qualification number. With use, the numbers are stored in the memory 32 and the list is checked subsequently to avoid repeat use.

A third class of contest participants might be considered lottery winners. For example, the sponsor might televise a drawing of three decimal digits to provide a sequence of

6

three numbers. The three numbers might identify "winning" or "entitled" participants by corresponding to the last three numbers (digits) of their telephone number. For example, the drawing of the numbers "257" would entitle a single call participation from any of the telephone terminals T1-TN designated by a number, the last three digits of which are "257".

In an exemplary contest format, participants might be asked a few test questions (for minor prizes and the ability to participate in a lottery). Of course, a vast variety of possibilities exist; and in that regard, interim prizes may be awarded to participants as the format proceeds from the initial call to the ultimate prize. At the present point, it is important to appreciate that the system accommodates participants using various telephone call modes with select qualification to participate in an interface format utilizing voice prompt and push-button digital communication. In accordance with the described example, the sponsor invites participants to enter using "900" calling mode service. As a part of such an invitation, persons are advised that "free" entry or participation may be gained by sending a self-addressed envelope to receive an entry number, e. g. eight digits, for use via "800" calling mode service. In the disclosed embodiment, the eight-digit numeral is coded for verification. Of course, numerous possibilities exist. As a simple example the second and sixth digits of the number might have a specific sum, e. g. seven or seventeen. That is, the second and sixth digits might be: three and four, five and two, six and one, seven and zero, nine and eight and so on. A qualifying number would be: "34726313", the second and sixth digits being four and three, respectively.

With the arrangements completed for calling entries in the "900" and "800" mode, the contest might operate for several days before being opened to area-calling participants. That is, the area-calling mode might be available only after a televised drawing entitling participation from a select group of telephone numbers for a limited period of time.

In view of the above assumptions and descriptions, consider now the operation of the system as depicted in FIG. 1 in relation to the process diagram of FIG. 2. That is, assume the system of FIG. 1 is implemented and programmed to accommodate the exemplary operations as will now be described with reference to the process diagram of FIG. 2.

First, suppose a caller at the terminal T1 places a call in the "900" mode in response to an advertisement by a sponsor promoting XYZ Widgets. Perhaps the caller will receive at least a token gift and might qualify for a major lottery prize.

The assumed call involves the caller actuating the buttons 14 as for example to input: "1 900 5558945". As a result, signals are provided to the communication facility CO resulting in a connection from the remote terminal T1 to the audio response unit 22. With the connection, the communication system CO also provides the audio response unit 22 with digital identification signals representative of the designation for remote terminal T1 ("212 627 2222"). The identification signals are provided by the ANI equipment within the communication facility CO and are registered by the audio response unit 22. The operation is illustrated as a process step in FIG. 2 by the block 50 (upper right) for "900" mode calls.

As suggested above, it may be desirable for a format to provide a token award to all callers in the "900" mode. Recognizing such particulars as possibilities, in the disclosed embodiment, calls in the "900" mode are passed through the audio response unit 22 (FIG. 1) and the coupler 24 to the interface processor 26. Accordingly, the interface

5,828,734

7

processor 26 receives the calling number and processes the contest format as described in detail below.

The initial step of the format common to all call modes is represented by the block 52 in FIG. 2. However, as calls in all modes are processed similarly from that point, before proceeding with the explanation, the preliminary operations attendant other calling modes first will be explained.

As explained above, certain accommodations are made for participation in the "800" (caller free) mode. Accordingly, assume a caller at the terminal T1 has been given an identification number: "34726313" for use in the "800" mode. Accordingly, the caller dials a number, e. g. "800 555 3478", actuating the terminal T1 and the communication facility CO to provide a connection with the audio response unit 18. With communication, the audio response unit actuates an internal voice generator prompting the caller to key in his assigned number, "34726313". As the digits of the number are keyed in by the caller, they are supplied from the audio response unit 18 to the control unit 28 and the free-call memory 32.

Within the control unit 28, logic is provided for verifying the identification number as proper. In accordance with the simple example explained above, the control unit 28 would simply sum the second and sixth digits to test for a total of "7". The coincidence test is represented by the query block 56 in FIG. 2. As indicated above, various codes and verification techniques are well known along with the apparatus for verifying assigned numbers.

If the control unit 28 validates the qualification number "34726313", it is recorded in the free-call memory 32 for future checking against repeat use. Accordingly, each call in the "800" mode also involves a check or test from the audio response unit 18 to the memory 32 to determine whether or not the assigned qualification number has been previously used. The previous-use test is illustrated as a process step by the query block 58 in FIG. 2.

If the control unit 28 determines the qualification number to be invalid or the memory 32 reveals the number has been previously used, the communication is aborted by the audio response unit 18. For example, the audio response unit 18 may be actuated to provide simulated audio signals carrying a message terminating the communication. For example, the caller might be advised: "The number you have provided is not valid. Consequently, your participation cannot be accepted on that basis." If the entered number is valid and has not been previously used, the tests indicated by the query blocks 56 and 58 (FIG. 2) are positive and the process again proceeds to the common step as indicated by the block 52, e. g. as to receive a token gift.

As indicated above, a third possibility for contest participation involves calling in the area-code mode. While numerous format possibilities exist, as suggested above, access for callers in the area-code mode might be limited to a relatively short period of time. For example, a television program advertising the XYZ Widget might include a drawing to select the telephone terminals from which callers may participate for a period of twenty-four hours. As indicated above, the drawing might identify the last three digits of telephone numbers for the approved terminals.

Following a relatively short time (e. g. one day) during which area-code callers may enter the contest, the contest might be concluded with the ultimate winner or winners determined. In any event, assume the presence of a caller at the terminal T2 with an approved telephone number, i. e. "212 627 2257". Somewhat as explained above with respect to other calling modes, keying operations by the caller at the

8

remote terminal T2 result in a connection through the communication system CO to the audio response unit 20. As previously, the communication facility CO provides digital signals to the audio response unit 20 indicating the calling number (ANI). Thus, the calling number is registered as indicated by the block 62 in FIG. 2. As previously, in the event ANI equipment is not operative to serve the remote terminal T2, then the caller may be asked to key in his telephone number for subsequent verification.

From the audio response unit 20, the caller's number is supplied to the coincidence detector and storage unit 34 for a two-stage test. A first test simply seeks a coincidence between the approved number sequence (three digits) and the last three digits of the calling number. In the example, the last three digits of the calling number ("257") are compared with the select digit sequence, "257". The test is indicated by the query block 64 in FIG. 2.

As a secondary test, the unit 34 may check a record of previous use. Thus, the unit 34 simply implements test logic to accomplish these comparison-step operations with structures as well known in the prior art.

If the tests are negative, as indicated by the query block 64, the communication is aborted as indicated by the block 60. Alternatively, a favorable test again directs the system to proceed to the step of block 52 at which the process enters a common phase for all calling modes.

With the entry of a call into the common phase, the line carrying the call is connected through the coupler 24 (FIG. 1) to the interface processor 26. That is, depending on the call mode, the call is passed through one of the audio response units 18, 20 or 22 and the coupler 24 to the interface processor 26. Note that as indicated above, each of the audio response units 18, 20 and 22 is capable of accommodating a large number of asynchronous calls. Similarly, the coupler 24 is capable of connecting lines from the audio response units 18, 20 and 22 (LB1, LB2 and LB3 respectively) to the interface processor on an individual basis through lines 37 and 39.

The interface processor 26 may comprise a relatively substantial computing capability for processing many individual calls with programmed variations. The processing operation is illustrated in FIG. 2 beginning with the block 52. However, note that as the interface processor 26 receives the telephone number identifying a calling terminal (ANI) reference may be made to a data bank. Therefore, the operation might involve reference to substantial data on a caller. Accordingly, a basis exists for several process variations accommodated by data from a bank. The block 52 represents such possibilities as well as further informing or processing callers.

With the receipt of a call at the interface processor 26, a voice generator may be actuated to specifically inform a caller, depending upon the specific format employed. Essentially, digital signals are provided to actuate a voice generator within the processor 26. Accordingly, an audio message is provided through the coupler 24, the associated audio response unit, and the communication facility CO to the connected remote terminal. Thus, the caller may be further informed or cued.

In the disclosed embodiment, concurrently with the operation of further informing the caller, the interface processor 26 actuates the random number generator 40 to provide a random address for the question memory 38. The process step is illustrated in FIG. 2 by the block 66.

The random number (identifying a question in the memory 38) is also provided to the coincidence detector 42

5,828,734

9

to test for the previous use of the question to the calling terminal. In that regard, the interface processor 26 provides the caller telephone number (ANI) to the caller record 44 which may simply take the form of a look-up table addressed by calling numbers and revealing the identification of previous questions propounded. The addresses of questions previously recorded for a calling number are supplied to the coincidence detector 42 for comparison with the current tentative question identification number. The process step is illustrated by the query block 68 in FIG. 2.

If the tentative question has been previously used for the calling terminal, a signal is provided from the coincidence detector 42 to the interface processor prompting a repeat operation by the random number generator 40 to select another question.

Alternatively, if the tentative question is not a repeat, then the coincidence detector 42 qualifies the gate 46 and the tentative question is supplied to the interface processor 26 for actual use. Note that upon the occurrence of an approved question, the coincidence detector also supplies a signal to the call record 44 which records the identification number of the question. The process step is illustrated in FIG. 2 by the block 70.

With the provision of signals representing a question through the gate 46 to the interface processor 26, the internal voice generator is actuated to propound the question to the caller. Recognizing the vast possibilities for contest formats, one or more rather difficult questions might be propounded to isolate lottery participants. Alternatively, a relatively easy question may be propounded as a minor obstacle to participation in the final phase of the contest. In any event, as prompted or cued, the caller responds using the buttons 14 and the response is registered for testing within the interface processor 26. The process steps are indicated by the block 72 and the query block 74 in FIG. 2. The results of the tests are then stored in the interface result memory 36. Note that in the interests of human perception, a printed record may be developed concurrently with the qualification of lottery participants.

Final processing to determine a winner or winners may involve any of various operations as a drawing, an event, and so on. Accordingly, as indicated by the blocks 76 and 78, final determinations are made of winners and losers with predetermined prize allocations. Thus, the system of the present invention enables effective regulation and control of interfaces between persons at telephone stations and a central processing apparatus. Calls in various modes are accommodated with appropriate tests, and interface data (e. g. test questions) are qualified.

In view of the above descriptions, it will be apparent that the disclosed embodiment is susceptible to considerable modification in the implementation of the present invention in conjunction with a telephone system to accommodate caller interface operations. Although the disclosed embodiment is directed to a contest, it will be apparent that aspects of the system may be variously embodied to accommodate any of a variety of telephone interface operations. Furthermore, it will be apparent that while the disclosed embodiment comprises specific elements and configurations, any of a variety of structures might well be utilized. Accordingly, the scope hereof is deemed to be as set forth in the claims below.

What is claimed is:

1. A telephone call processing system for receiving calls from a multitude of terminals in different call modes including a caller-charge call mode and at least a toll free call mode

10

for processing to interactive interface formats of a desired application and involving digital signals including digital signals indicative of DNIS, said system comprising:

first response unit means for receiving calls in said toll free call mode with a select called number identified by said digital signals indicative of DNIS;

qualification means for qualifying on-line said calls in said toll free call mode received by said first response unit to provide qualified calls;

second response unit means for receiving calls in said caller-charge call mode with another select called number identified by said digital signals indicative of DNIS;

means for processing calls concurrently in both call modes in accordance with preliminary operations of said toll free call mode and said caller-charge call mode; and

means for coupling said qualified calls received by said first response unit means and said calls in said caller-charge mode for concurrent processing in accordance with common operations of said interactive interface formats of said desired application.

2. A telephone call processing system according to claim 1 wherein said qualification means comprises a test structure, for testing said digital signals including digital signals provided by at least certain of said multitude of terminals originating said calls in said toll free call mode.

3. A telephone call processing system according to claim 2, further including limited use memory structure to tally digital signals provided by said multitude of terminals with said toll free call mode to accommodate toll free access and wherein said means for testing tests the content of said limited use memory structure.

4. A telephone call processing system according to claim 1 wherein said interactive interface formats of said desired application relate to a game and said processing means isolates winners based on correct answers provided during said calls.

5. A telephone call processing system according to claim 1, wherein said digital signals indicative of said select called number or said another select called number dialed by callers at said multitude of terminals (DNIS) are provided by a communication facility to identify select interactive interface formats of said desired application selected from a plurality of distinct interactive operating the content of said memory structure. interface formats.

6. A telephone call processing system according to claim 1, wherein said digital signals include digital signals representing calling terminal numbers associated with at least certain of said multitude of terminals automatically provided from a communication facility.

7. A telephone call processing system according to claim 6, further comprising the step of:

means for storing said digital signals representing said calling terminal numbers associated with said multitude of terminals automatically provided from said communication facility.

8. A telephone call processing system according to claim 6, wherein said qualification means for qualifying said calls in said toll free call mode, tests at least certain of said digital signals representing calling terminal numbers associated with at least certain of said multitude of terminals based on limited use.

9. A telephone call processing system according to claim 1, wherein said caller charge call mode is a "900" call mode.

10. A telephone call processing system according to claim 1, wherein said toll free call mode is an "800" call mode.

5,828,734

11

11. A process for receiving calls through a telephonic communication facility from a multitude of terminals in different call modes including a toll free call mode and a “900” call mode and processing said calls in accordance with respective interactive interface formats for said different call modes, wherein the process involves digital signals including digital signals provided by said multitude of terminals as for identification or data, comprising the steps of:

receiving calls in said toll free call mode;
 providing a qualification number to facilitate toll free participation via said toll free call mode;
 qualifying on-line said calls in said toll free call mode based on said qualification number to provide qualified calls;
 receiving calls in said “900” call mode; and
 concurrently processing said qualified calls received in said toll free call mode and said calls in said “900” mode in accordance with common operations of interactive interface formats for said toll free and said “900” call modes.

12. A process for receiving calls according to claim 11, wherein at least callers calling in the toll free call mode are subject to limited use.

13. A process for receiving calls according to claim 12, wherein said qualification number is further tested for said limited use during a limited period of time.

14. A process for receiving calls according to claim 11, wherein said qualification number provided by callers during said calls is coded for verification.

15. A process for receiving calls according to claim 14, wherein said qualification number is further tested for said limited use during a limited period of time based upon entitlement.

16. A process for receiving calls according to claim 11, wherein said step of providing a qualification number to a caller includes providing said qualification number by mail.

17. A process for receiving calls according to claim 11, wherein a data bank relating to a caller is accessed to reference data on a caller.

18. A process for receiving calls according to claim 11, wherein digital signals indicative of numbers dialed by callers at said multitude of terminals are provided by said telephonic communication facility (DNIS) to identify said respective interactive interface formats selected from a plurality of distinct interactive operating interface formats.

19. A process for receiving calls according to claim 18, further comprising the step of:

providing preliminary automated greetings specific to said respective interactive interface formats, prior to execution of said common operations of said interactive interface formats.

20. A process for receiving calls according to claim 18, wherein said respective interactive interface formats are associated with an information service.

21. A process for receiving calls according to claim 11, further comprising the steps of:

receiving DNIS signals indicative of a plurality of called numbers to identify select interactive interface formats from a plurality of interactive formats;

receiving caller identification signals indicative of currently active of callers making said calls from said multitude of terminals;

storing one or more caller cues and use indications for said caller cues in relation to said currently active of said callers as identified by said identification signals;

12

receiving said caller cues to provide responses from said currently active of said callers in the form of digital data signals; and

selecting a caller cue for said currently active caller under control of said identification signals and said use indications for said currently active caller whereby to limit and control caller cues provided to individual callers based upon cues previously provided to and identified with said individual callers.

22. A process for receiving calls according to claim 21, further comprising the steps of:

prompting callers calling from said multitude of terminals in said different call modes with multiple questions; and

further receiving responses from said callers in the form of digital data developed by said multitude of terminals to isolate a subset of callers.

23. A process for receiving calls according to claim 11, further comprising the steps of:

receiving said qualification number in the form of a caller pin-number as digital signals provided by said multitude of terminals for identification; and

said qualifying test including testing to determine if said caller pin-number is eligible to participate.

24. A process for receiving calls according to claim 23, wherein said caller pin-number is tested based on limited use.

25. A process for receiving calls according to claim 11, wherein said toll free call mode is an “800” call mode.

26. A process for receiving calls according to claim 11, further comprising the steps of:

prompting callers calling from said multitude of terminals in said different call modes with multiple questions; and

further receiving responses from said callers in the form of digital data developed by said multitude of terminals to isolate a subset of callers.

27. A telephone call processing system for receiving calls through a communication facility from a multitude of terminals in different call modes including at least a caller charge call mode for processing to respective interactive interface formats for said different call modes and involving digital signals including digital signals provided by said multitude of terminals as for identification or data, said system comprising:

first response unit means for receiving calls in said caller charge call mode;

second response unit means for receiving calls in a toll free call mode;

qualification means for receiving and testing calling number identification signals automatically provided by said communication facility to indicate calling terminals numbers for certain of said multitude of terminals to qualify online said calls in said toll free call mode received by said second response unit to provide qualified calls;

means for concurrently processing calls received by both response unit means to preliminary operations of said respective interactive interface formats for said different call modes; and

means for coupling said calls received in said caller charge call mode and said qualified calls received in said toll free call mode for concurrent processing in accordance with common operations of said respective interactive interface formats.

5,828,734

13

28. A telephone call processing system according to claim 27 wherein said qualification means for qualifying calls in said toll free call mode also comprises a test structure for testing at least certain of said digital signals provided by said multitude of terminals originating said calls.

29. A telephone call processing system according to claim 28, wherein said test structure tests at least certain of said digital signals based on limited use.

30. A telephone call processing system according to claim 27 further including a limited use memory structure to tally said digital signals provided by said multitude of terminals with said toll free call mode to accommodate toll free access and wherein said means for testing tests the content of said limited use memory structure.

31. A telephone call processing system according to claim 27, wherein digital signals indicative of numbers dialed by callers at said multitude of terminals (DNIS) are provided by said communication facility to identify said interactive interface formats from a plurality of interactive formats.

32. A telephone call processing system according to claim 27, further comprising:

third response unit means for receiving calls in a third call mode.

33. A telephone call processing system according to claim 32, wherein said third call mode is an area code call mode.

34. A telephone call processing system according to claim 27, wherein said caller charge call mode is a "900" call mode.

35. A telephone call processing system according to claim 27, wherein said toll free call mode is an "800" call mode.

36. A telephone call processing system according to claim 27, further comprising:

means for storing said calling number identification signals automatically provided by said communication facility.

37. A telephone call processing system according to claim 27, wherein said qualification means tests said calling number identification signals based on limited use.

38. A telephone call processing system according to claim 27, further comprising preliminary automated greetings specific to said respective interactive interface formats, provided to individual callers prior to execution of said common operations of said respective interactive interface formats.

39. A telephone call processing system for receiving calls from a multitude of terminals in different call modes including a toll free call mode and a caller charge call mode, for processing to respective interactive interface formats for said different call modes and involving digital signals provided by said multitude of terminals as for identification or data, further where said system includes a communication facility which automatically provides digital DNIS signals which identify a number dialed by callers at said multitude of terminals, said digital DNIS signals indicative of the respective interactive interface formats for said different call modes selected, comprising:

first response unit means for receiving calls in said toll free call mode, and further wherein an interactive interface format for said toll free call mode is identified by said digital DNIS signals;

qualification means for qualifying on-line said calls in said toll free call mode received by said first response unit means to provide qualified calls, said qualification means comprising means for testing said digital signals provided by said multitude of terminals originating calls in said toll free call mode including caller pin-number data, said caller pin-number data to be tested for approval; and

14

second response unit means for receiving calls in said caller charge call mode, further where another interface interactive format for said caller charge call mode is identified by said digital DNIS signals; and

means for coupling said qualified calls received in said toll free call mode and said calls received by said second response unit means for concurrent processing to common operations of said interactive interface format for said toll free call mode and said interactive interface format for said caller charge call mode.

40. A telephone call processing system for receiving calls according to claim 39, wherein said interactive interface format and said another interactive interface format selected by said digital DNIS signals are selected from a plurality of distinct interactive operating formats.

41. A telephone call processing system for receiving calls according to claim 39, further comprising call record memory means for storing data relating to said calls addressable by said digital signals provided by said multitude of terminals.

42. A telephone call processing system for receiving calls according to claim 41, wherein said digital signals comprise said caller pin-number data.

43. A telephone call processing system for receiving calls according to claim 39, further comprising a test to determine if said caller pin-number data is eligible to participate.

44. A telephone call processing system for receiving calls according to claim 43, wherein said test tests said caller pin-number data for limited use.

45. A telephone call processing system according to claim 39, wherein said qualification means qualifies on-line said calls by testing based on a one time only use.

46. A telephone call processing system according to claim 43, wherein said qualification means further tests said digital signals representing calling terminal numbers based on limited use.

47. A telephone call processing system according to claim 39, wherein said caller charge call mode is a "900" call mode.

48. A telephone call processing system according to claim 39, wherein said toll free call mode is an "800" call mode.

49. A telephone call processing system according to claim 39, further comprising preliminary automated greetings specific to said interactive interface format for said toll free call mode and said another interactive interface format for said caller charge call mode provided to individual callers prior to execution of said common operations.

50. A telephone call processing system for receiving calls from a multitude of terminals in different calling modes including a toll free call mode and a caller charge call mode for processing to respective interactive interface formats for said different calling modes and involving digital signals including digital signals provided by callers at said multitude of terminals as for identification or other use, said system comprising:

first response unit means for receiving calls in said toll free call mode;

qualification means for qualifying on-line said calls in said toll free call mode received by said first response unit to provide qualified calls, said qualification means comprising means for testing said digital signals provided by said multitude of terminals and originating calls in said toll free call mode;

call record memory means for storing data identifying said callers, addressable by said digital signals provided by said callers at said multitude of terminals;

a second response unit means for receiving calls in said caller charge call mode;

5,828,734

15

means for concurrently processing calls received by both response unit means for preliminary operations of said respective interactive interface formats; and

means for coupling said qualified calls received in said toll free call mode and said calls received by said second response unit means for concurrent processing to common operations of said respective interactive interface formats.

51. A telephone call processing system for receiving calls according to claim 50, wherein each of said respective interactive interface formats is one of a plurality of distinct interactive interface formats and selection of each specific interactive interface format is based on digital DNIS signals automatically provided from a communication facility.

52. A telephone call processing system for receiving calls according to claim 50, wherein said qualification means verifies a caller provided pin-number.

53. A telephone call processing system for receiving calls according to claim 52, wherein said qualification means determines if said caller provided pin-number is eligible to participate.

54. A telephone call processing system for receiving calls according to claim 53, wherein said pin-number is tested for limited use. to select said questions.

55. A telephone call processing system for receiving calls according to claim 54, wherein said limited use is a one time only use.

56. A telephone call processing system for receiving calls according to claim 50, wherein said qualification means qualifies calls on-line based on a caller provided pin-number, said qualification means testing said pin-number for check digit verification.

57. A telephone call processing system according to claim 50, wherein said caller charge call mode is a "900" call mode.

58. A telephone call processing system according to claim 50, wherein said toll free call mode is an "800" call mode.

59. A telephone call processing system for receiving calls according to claim 50, further comprising preliminary automated greetings specific to each of said respective interactive interface formats for said toll free call mode and said caller charge call mode provided to individual callers prior to execution of said common operations of said respective interface formats.

60. A telephone call processing system for receiving calls from a multitude of terminals for processing to an interface format and involving digital signals including digital signals associated with said multitude of terminals as for identification or data, said system comprising:

cue means for prompting responses to questions, from said multitude of terminals in the form of digital signals as data;

question selection means for selecting individual questions from a plurality of questions for actuating said cue means, said question selection means including a random selection means to select said individual questions;

test means for testing said individual questions as correct or incorrect; and

processing means to process responses to said individual questions to isolate a subset of callers.

61. A telephone call processing system according to claim 60, further comprising means for receiving and storing caller identification data.

62. A telephone call processing system for receiving calls according to claim 60, wherein said question selection

16

means selects questions from a plurality of batches of question, said plurality of batches distinguished from each other base upon a level of difficulty of the questions in each of said batches.

63. A telephone call processing system for receiving calls according to claim 60, wherein a random number generator is used to select said questions.

64. A telephone call processing system for receiving calls through a telephonic communication facility from a multitude of terminals in a caller charge call mode for processing data in accordance with any of a plurality of interactive operating process formats and involving digital signals including digital signals indicative of DNIS, said system comprising:

first response unit means for receiving calls in a caller charge call mode wherein digital signals indicative of one of a plurality of distinct called numbers (DNIS) identifies one of said plurality of interactive operating process formats;

second response unit means for receiving calls in a "900" caller charge call mode wherein digital signals indicative of one other of said plurality of called numbers (DNIS) identifies another of said plurality of interactive operating process formats;

voice generator means for prompting callers with voice prompts whereby callers enter data in response to said voice prompts;

qualification means for qualifying on-line at least said calls utilizing said one other of said plurality of called numbers in said "900" caller charge call mode received by said second response unit to provide qualified calls;

means for processing qualified calls received by said second response unit means and said calls received by said first response unit means for concurrent processing of data in accordance with at least certain common operations of said one and said another of said plurality of interactive operating process formats; and

audio control unit coupled to said voice generator for providing a distinct automated greeting under control of said digital signals (DNIS) to callers calling at least said one of said distinct called numbers identifying said one of said plurality of interactive operating process formats.

65. A telephone call processing system according to claim 64, wherein said voice generator means prompts responses to at least one question in the form of interactively entered data provided by said callers calling at least one of said distinct called numbers; and said system further comprises:

means for storing said interactively entered data.

66. A telephone call processing system according to claim 64, further comprising:

means for receiving digital signals representing calling terminal numbers associated with at least certain of said multitude of terminals automatically provided from said telephonic communication facility.

67. A telephone call processing system according to claim 66, further comprising:

means for storing digital signals representing calling terminal numbers associated with said multitude of terminals automatically provided from said telephonic communication facility.

68. A telephone call processing system according to claim 64, wherein said qualification means tests digital signals representing calling terminal numbers associated with at least certain of said multitude of terminals automatically provided from said telephonic communication facility.

5,828,734

17

69. A telephone call processing system according to claim 68, wherein said qualification means tests said digital signals representing said calling terminal numbers based on limited use.

70. A telephone call processing system according to claim 64, further comprising:

means for providing identification signals to said qualification means indicative of currently active of said callers;

memory means for storing one or more caller cues and use indications for said caller cues in relation to said currently active of said callers as identified by said identification signals;

cue means for receiving said caller cues to provide responses from said currently active callers in the form of digital data signals; and

means for selecting a caller cue from said memory means for said currently active caller for application to said cue means under control of said identification signals and said use indications stored in said memory means for said currently active caller whereby to limit and control caller cues provided to individual callers based upon cues previously provided to and identified with said individual callers.

71. A telephone call processing system according to claim 64, wherein said means for processing processes caller entered data to isolate a subset of said callers.

72. A telephone call processing system according to claim 71, wherein said means for processing utilizes multiple comparative processing operations to isolate said subset of callers.

73. A telephone call processing system according to claim 64, wherein said interactive operating processing format is a form of an information service format.

74. A telephone call processing system according to claim 73, wherein said PIN number data is further tested for limited use during a limited period of time based upon entitlement.

75. A telephone call processing system according to claim 73, wherein said means for processing calls isolates a subset to callers based upon data entered by said callers responsive to prompting by said voice generate means and wherein said means for processing calls further isolates a sub-subset of callers also responsive to further data entered by said callers responsive to further prompting by said voice generator means.

76. A telephone call processing system according to claim 64, wherein qualification by said qualification means of said calls includes qualification of caller provided identification data.

77. A telephone call processing system according to claim 76, wherein said caller provided identification data further includes PIN number data.

78. A telephone call processing system according to claim 64, wherein said caller charge call mode is a "900" call mode.

79. A telephone call processing system according to claim 64, wherein said means for concurrently processing isolates a subset of callers based upon data entered by said callers responsive to prompting by said voice generator and wherein said means for concurrently processing further isolates a sub-subset of callers also responsive to further data entered by said callers responsive to further prompting by said voice generator.

80. A telephone call processing system according to claim 64, wherein said first response unit means receives calls in a "900" caller charge call mode.

18

81. A telephone call processing system for receiving calls through a telephonic communication facility from a multitude of terminals in a toll free call mode for processing data in accordance with any of a plurality of interactive operating process formats and involving digital signals including DNIS, said system comprising:

first response unit means for receiving calls in said toll free call mode wherein digital signals indicative of at least one of a plurality of distinct called numbers (DNIS) identify one of said plurality of interactive operating process formats;

voice generator means for prompting callers with voice prompts whereby said callers enter data in response to said voice prompts;

qualification means for qualifying on-line at least said calls utilizing said one of said plurality of distinct called numbers (DNIS) in said toll free call mode received by said first response unit to provide qualified calls;

second response unit means for receiving calls in said toll free call mode wherein digital signals indicative of one other of said plurality of distinct called numbers (DNIS) identify another of said plurality of interactive operating process formats;

means for processing qualified calls received by said first response unit means and said calls received by said second response unit means for concurrent processing of data in accordance with at least certain common processing operations of said one and said another of said interactive operating process formats; and

audio control unit coupled to said voice generator means for providing a preliminary automated voice prompt to cue callers to interactively enter data under control of said digital signals (DNIS) to callers calling said one other of said plurality of distinct called numbers prior to execution of said common processing operations of said one and said another of said interactive operating process formats.

82. A telephone call processing system according to claim 81, wherein qualification of said calls in said toll free call mode is based upon a test of caller provided identification data based upon limited use.

83. A telephone call processing system according to claim 82, wherein said limited use is a one-time only use.

84. A telephone call processing system according to claim 82, wherein digital signals indicative of identification data indicate a personal identification number.

85. A telephone call processing system according to claim 82, wherein said limited use limits use by callers during a single period of time.

86. A telephone call processing system according to claim 81, wherein said data includes caller pin-number data which is subject to limited use.

87. A telephone call processing system according to claim 86, further comprising a test for said limited use for said caller pin number data comprising a one time only use test.

88. A telephone call processing system according to claim 86, wherein said data including caller pin-number data is further subject to said limited use during a limited period of time based upon entitlement.

89. A telephone call processing system according to claim 81, wherein said digital signals indicative of at least one of said plurality of distinct called numbers (DNIS) dialed by callers at said multitude of terminals are automatically provided by said telephonic communication facility to identify said one interactive operating process format from said plurality of interactive operating process formats.

5,828,734

19

90. A telephone call processing system according to claim **81**, wherein digital signals representing calling terminal numbers associated with said multitude of terminals are automatically provided by said telephonic communication facility.

91. A telephone call processing system according to claim **90**, further including memory means for storing said digital signals.

92. A telephone call processing system according to claim **90**, wherein said qualification means tests said digital signals representing calling terminal numbers associated with at least certain of said multitude of terminals, automatically provided from said telephonic communication facility.

93. A telephone call processing system according to claim **92**, wherein said qualification means comprises a use limit test of said calling terminal numbers.

94. A telephone call processing system according to claim **81**, further including memory means for storing data and control means for restricting the extent of access to said system based on at least one of caller provided data or calling terminal data automatically provided by said telephonic communication facility.

95. A telephone call processing system according to claim **81**, wherein said voice generator means prompts responses to at least one voice prompt in the form of interactively entered data provided by said callers calling one of said distinct called numbers.

96. A telephone call processing system according to claim **95**, wherein at least certain of said responses are stored.

97. A telephone call processing system according to claim **95**, wherein said voice generator means prompts responses to said at least one question upon receiving calling terminal numbers associated with said multitude of terminals, automatically provided by said telephonic communication facility.

98. A telephone call processing system according to claim **81**, wherein digital signals representing calling terminal numbers associated with said multitude of terminals automatically provided from said telephonic communication facility are used to access a data bank relating to calls from said multitude of terminals.

99. A telephone call processing system according to claim **98**, wherein said databank is updated with data relating to said calling terminal numbers.

100. A telephone call processing system according to claim **81**, wherein said qualification means tallies calls placed to one of said toll free call mode distinct numbers up to a predetermined limit.

101. A telephone call processing system according to claim **81**, wherein said data entered by said callers is used to update data for said callers in a databank relating to said callers.

102. A telephone call processing system according to claim **81**, wherein said qualification means tests calls against a limit of free calls available to callers of at least one of said toll free call mode distinct numbers.

103. A telephone call processing system according to claim **81**, further comprising:

means for receiving digital signals representing calling terminal numbers associated with at least certain of said multitude of terminals automatically provided from said telephonic communication facility.

104. A telephone call processing system according to claim **103**, further comprising:

means for storing said digital signals representing calling terminal numbers associated with said multitude of terminals, automatically provided from said telephonic communication facility.

20

105. A telephone call processing system according to claim **104**, wherein said digital signals representing calling terminal numbers are tested based on limited use.

106. A telephone call processing system according to claim **81**, further comprising:

means for providing identification signals to said qualification means indicative of currently active of said callers;

memory means for storing one or more caller cues and use indications for said caller cues in relation to said currently active of said callers as identified by said identification signals;

cue means for coupling said caller cues to said voice generator means to provide responses from said currently active of said callers in the form of digital data signals; and

means for selecting a caller cue from said memory means for a currently active caller for application to said cue means under control of said identification signals and said use indications stored in said memory means for said currently active caller whereby to limit and control caller cues provided to individual callers based upon cues previously provided to and identified with said individual callers.

107. A telephone call processing system according to claim **81**, wherein said means for processing processes data provided by callers to update a databank relating to said callers.

108. A telephone call processing system according to claim **81**, wherein said means for processing processes at least a portion of said data entered by said callers in response to said voice generator means to update said caller data in a data bank.

109. A telephone call processing system according to claim **81**, wherein said interactive operating process format is an on-line processing format in real-time.

110. A telephone call processing system according to claim **81**, wherein said means for processing processes caller entered data to isolate a subset of said callers.

111. A telephone call processing system according to claim **81**, wherein said means for processing comprises multiple comparative processing operations to isolate a subset of callers.

112. A telephone call processing system according to claim **81**, wherein said one interactive operating process format is a form of a financial information format.

113. A telephone call processing system according to claim **112**, wherein said financial information format includes provision of data on stocks and bonds.

114. A telephone call processing system according to claim **113**, further comprising:

means for providing identification signals to said qualification means indicative of currently active of said callers;

memory means for storing one or more caller cues and use indications for said caller cues in relation to said currently active of said callers as identified by said identification signals;

cue means for coupling said caller cues to said voice generator means to provide responses from said currently active callers in the form of digital data signals; and

means for selecting a caller cue from said memory means for said currently active caller for application to said cue means under control of said identification signals and said use indications stored in said memory means

5,828,734

21

for said currently active caller whereby to limit and control caller cues provided to individual callers based upon cues previously provided to and identified with said individual callers.

115. A telephone call processing system according to claim **114**, wherein digital signals provided by said callers in response to said prompting include personal identification number data.

116. A telephone call processing system according to claim **115**, wherein said means for processing processes at least a portion of said data entered by said callers in response to voice prompts to update said caller data in a data bank.

117. A telephone call processing system according to claim **81**, wherein said one and said another interactive operating process formats involve the sale of a product.

118. A telephone call processing system according to claim **117**, further comprising:

means for providing identification signals to said qualification means indicative of currently active of said callers;

memory means for storing one or more caller cues and use indications for said caller cues in relation to said currently active of said callers as identified by said identification signals;

cue means for coupling said caller cues to said voice generator means to provide responses from said currently active callers in the form of digital data signals; and

means for selecting a caller cue from said memory means for said currently active caller for application to said cue means under control of said identification signals and said use indications stored in said memory means for said currently active caller whereby to limit and control caller cues provided to individual callers based upon cues previously provided to and identified with said individual callers.

119. A telephone call processing system according to claim **118**, wherein digital signals provided by said callers in response to said prompting include personal identification number data.

120. A telephone call processing system according to claim **118**, wherein said means for processing processes at least a portion of said data entered by said callers in response to voice prompts to update said caller data in a data bank.

121. A telephone call processing system according to claim **81**, wherein said qualification means performs a test based upon caller provision of select digits of caller telephone numbers.

122. A telephone call processing system according to claim **121**, wherein at least said select digits of caller telephone numbers are automatically provided by digital signals from the telephonic communication facility.

123. A telephone call processing system according to claim **81**, wherein said plurality of interactive operating process formats include both a form relating to an information service and a form relating to the sale of a product.

124. A telephone call processing system according to claim **81**, wherein said one and said another interactive operating processing formats relate to an information service.

125. A telephone call processing system according to claim **124**, further comprising:

means for prompting callers calling from said multitude of terminals in said toll free call mode with multiple questions; and

means for receiving responses from said callers in the form of digital data developed by said multitude of terminals to isolate a subset of callers.

22

126. A telephone call processing system according to claim **81**, wherein qualification by said qualification means of said calls includes qualification of caller provided identification data.

127. A telephone call processing system according to claim **126**, wherein said caller provided identification data is indicative of PIN number data.

128. A telephone call processing system according to claim **81**, wherein said means for processing isolates a subset of callers based upon data entered by said callers responsive to prompting by said voice generator means and wherein said means for processing further isolates a sub-subset of callers also responsive to further data entered by said callers responsive to further prompting by said voice generator means.

129. A telephone call processing system according to claim **81**, wherein said toll free call mode is an "800" call mode.

130. A telephone call processing system according to claim **81**, further comprising:

a third response unit for receiving calls in an area code mode.

131. A telephone call processing system according to claim **81**, further comprising:

means for prompting callers calling from said multitude of terminals in said toll free call mode with multiple questions; and

means for receiving responses from said callers in the form of digital data developed by said multitude of terminals to isolate a subset of callers.

132. A telephone call processing system for receiving calls from a multitude of terminals in different call modes including a pay to dial call mode on a nationwide network for interactive communication and at least one toll free call mode for processing to respective interactive interface formats for said different call modes and involving digital signals associated with said multitude of terminals as for identification or data, said system comprising:

first response unit means for receiving calls in said toll free call mode;

qualification means for qualifying on-line said calls in said toll free call mode received by said first response unit means to provide qualified calls;

second response unit means for receiving calls in said pay to dial call mode on said nationwide network;

means for processing calls concurrently in both call modes in accordance with preliminary operations of said respective interactive interface formats for said different call modes; and

means for coupling said qualified calls received in said toll free call mode and said calls in said pay to dial call mode on said nationwide network for concurrent processing to common operations of said respective interactive interface formats.

133. A telephone call processing system according to claim **132**, wherein said pay to dial call mode is a "900" call mode.

134. A telephone call processing system according to claim **132**, wherein digital signals indicative of numbers dialed by callers at said multitude of terminals (DNIS) is provided by a communication facility to identify said respective interactive interface formats from a plurality of interactive operating formats.

135. A telephone interface system for individually interfacing callers at a multitude of remote terminals for voice-digital communication through a telephone communication facility, said system comprising:

5,828,734

23

communication means for establishing telephone communication between callers at certain of said multitude of remote terminals and select interactive operating formats through said telephone communication facility based on digital signals indicative of called numbers dialed by callers, which identify said select interactive operating formats from a plurality of operating formats (DNIS), wherein at least two called numbers identify at least two select interactive operating formats from said plurality of different formats, said communication means also receiving digital signals representing calling terminal number data associated with certain of said multitude of remote terminals automatically provided by said telephone communication facility;

means for receiving identification signals relating to said callers in accordance with one of said at least two select interactive operating formats and providing said identification signals to said communication means to indicate currently active of said callers, wherein a data bank relating to said identification signals is accessed to reference data for a caller;

memory means for storing one or more caller cues and use indications for said caller cues in relation to said currently active of said callers as identified by said identification signals;

cue means for receiving said caller cues to provide voice signals through said communication means to prompt responses from said currently active callers in the form of digital data signals; and

means for selecting a caller cue from said memory means for said currently active caller for application to said cue means under control of said identification signals and said use indications stored in said memory means for said currently active caller whereby to limit and control caller cues provided to individual callers based upon cues previously provided to and identified with said individual callers.

136. A telephone interface system according to claim **135** wherein said number dialed by said callers is associated with a toll free call mode.

137. A telephone interface system according to claim **135** wherein said select interactive operating format is accessed by a plurality of distinct called numbers identified by said digital signals and provided via a nationwide network for interactive communication.

138. A telephone interface system according to claim **135** wherein said digital signals (DNIS) are indicative of at least two distinct numbers dialed by callers to access common operations of said one select interactive operating format and another select interactive operating format of said interface system, and at least one of said numbers is associated with a toll free call mode and at least one other of said numbers requiring qualification of said callers based on data provided by said callers against data on said callers stored in a memory means.

139. A telephone interface system according to claim **135** wherein a data bank relating to a caller is accessed to reference data on a caller.

140. A telephone interface system according to claim **135**, wherein digital signals representing calling terminal numbers associated with certain of said multitude of remote terminals are automatically provided from a communication facility.

141. A telephone interface system according to claim **135**, wherein said one or more caller cues are limited and controlled to avoid duplication of certain of said cues.

142. A telephone interface system according to claim **135**, further comprising;

24

qualification means for limiting access to said select interactive operating formats based on use.

143. A telephone interface system according to claim **142**, wherein access to said select interactive operating formats is limited based on a one time only use.

144. A telephone interface system according to claim **135**, further comprising:

a voice generator for providing voice prompts to said callers to enter data; and

a processor for processing at least a portion of said data to update caller data in a data bank.

145. A telephone interface system according to claim **135**, further comprising:

means for qualifying callers on-line based upon provision of a PIN number including a test of said PIN number for verification of coded data.

146. A telephone interface system according to claim **135**, wherein a caller provides a PIN number data as indicated by said identification signals.

147. A telephone call interface according to claim **135**, wherein at least certain of said digital signals representing calling terminal number data associated with certain of said multitude of remote terminals are stored.

148. A telephone interface system according to claim **135**, wherein said call mode other than the caller charge call mode is a "900" call mode.

149. A telephone interface system according to claim **135**, wherein said digital signals representing calling terminal number data are tested based on limited use.

150. A telephone call processing system according to claim **135** wherein said memory stores at least a portion of said digital signals representing calling terminal number data.

151. A telephone call processing system for receiving calls through a telephonic communication facility from a multitude of terminals in different call modes including a toll free call mode, a pay to dial call mode, or an area code call mode for processing to respective interactive interface formats for different call modes and involving digital signals associated with said multitude of terminals as for identification or data, comprising:

first response unit means for receiving calls in said toll free call mode or said area code call mode;

second response unit means for receiving calls in a caller charge call mode;

qualification means for qualifying on-line said calls in said toll free call mode or said area code call mode;

audio control unit coupled to said first and second response units for answering incoming calls received for said first response unit and said second response unit and cuing certain callers subject to qualification by said qualification means; and

processing means for selectively processing said calls received by said first response unit in said toll free call mode or said area code call mode with calls received by said second response unit for concurrent processing in accordance with common operations of respective interactive interface formats.

152. A telephone call processing system according to claim **151**, wherein said first response unit receives calls only in said toll free call mode.

153. A telephone call processing system according to claim **151**, wherein said first response unit receives calls in said pay to dial call mode such as said "900" call mode.

154. A telephone call processing system according to claim **151**, wherein said first response unit receives calls only in said area code call mode.

5,828,734

25

155. A telephone call processing system according to claim 151, wherein digital signals indicative of a number dialed by callers at said multitude of terminals (DNIS) for said toll free call mode or said caller charge mode is provided by said telephonic communication facility to identify each of said respective interactive interface formats.

156. A telephone call processing system according to claim 155, further comprising:

communication means for establishing telephone communication between callers at certain of said multitude of terminals and each of said respective interface formats;

means for providing identification signals to said communication means indicative of currently active of said callers;

memory means for storing one or more caller cues and use indications for said caller cues in relation to said currently active of said callers as identified by said identification signals;

cue means for receiving said caller cues to provide responses from said currently active callers in the form of digital data signals; and

means for selecting a caller cue from said memory means for said currently active caller for application to said cue means under control of said identification signals and said use indications stored in said memory means for said currently active caller whereby to limit and control caller cues provided to individual callers based upon cues previously provided to and identified with said individual callers.

157. A telephone call processing system according to claim 151, wherein said qualification means qualifies on-line said calls by testing identification data provided by said callers based on limited use.

158. A telephone call processing system according to claim 157, wherein said limited use is controlled by digital signals indicative of a calling terminal number automatically provided by said telephonic communication facility.

159. A telephone call processing system according to claim 157, wherein said qualification means further qualifies said calls by testing identification data based on limited use during a limited period of time.

160. A telephone call processing telephone call processing system according to claim 151, further comprising:

means for receiving digital signals representing numbers associated with at least certain of said multitude of terminals automatically provided from said telephonic communication facility.

161. A telephone call processing system according to claim 160, further comprising:

means for storing digital signals representing numbers associated with said multitude of terminals, automatically provided from said telephonic communication facility.

162. A telephone call processing system according to claim 151, wherein said qualification means tests digital signals representing calling terminal numbers associated with at least certain of said multitude of terminals, automatically provided from said telephonic communication facility.

163. A telephone call processing system according to claim 151, wherein digital signals representing calling terminal numbers associated with at least certain of said multitude of terminals automatically provided from said telephonic communication facility are used to access a data bank relating to callers.

164. A telephone call processing system according to claim 151, wherein digital signals indicative of a number

26

dialed by callers at said multitude of terminals (DNIS) is provided by said telephonic communication facility to identify each of said respective interactive interface formats selected from a plurality of distinct interactive operating interface formats.

165. A telephone call processing system according to claim 164, wherein each of said respective interactive interface formats is associated with an information service.

166. A telephone call processing system according to claim 164, wherein said audio control unit provides a preliminary automated greeting under the control of said digital signals (DNIS) to callers calling whereby said preliminary automated greeting is specific to said number dialed by callers and each of said respective interactive interface formats.

167. A telephone call processing system according to claim 151, wherein said qualification means qualifies callers on-line based upon a specified limit on use.

168. A telephone call processing system according to claim 167, wherein said limit on use is a one time only use.

169. A telephone call processing system according to claim 167, wherein said limit on use involves a limited number of uses.

170. A telephone call processing system according to claim 151, wherein each of said respective interactive interface formats is an on-line, real-time processing format.

171. A telephone call processing system according to claim 151, further comprising:

voice generator means for prompting callers with voice prompts.

172. A telephone call processing system according to claim 171, wherein said callers provide answer data in response to said voice prompts.

173. A telephone call processing system according to claim 172, wherein said answer data is used at least in part to update a databank on said callers.

174. A telephone call processing system according to claim 171, wherein said callers are prompted by said voice generator means to provide data, and at least a portion of said data is processed by said processor to update caller data stored in a data bank.

175. A telephone call processing system according to claim 151, wherein said first response unit means receives calls only in said area code mode and said second response unit means receives calls only in said caller charge mode and said system further comprises:

a third response unit means for receiving calls in said toll free call mode.

176. A telephone call processing system according to claim 151, wherein said caller charge call mode is a "900" call mode.

177. A telephone call processing system according to claim 151, wherein said toll free call mode is an "800" call mode.

178. A telephone call processing system for receiving calls through a telephonic communication facility from a multitude of terminals in a toll free call mode comprising a plurality of distinct called numbers associated with said toll free call mode for processing calls to select interactive interface operating formats from a plurality of interactive interface operating formats and involving digital signals including digital signals associated with said multitude of terminals as for identification or data, said system comprising:

first response unit means for receiving calls in said toll free call mode wherein digital signals indicative of at least one of said plurality of called numbers (DNIS)

5,828,734

27

identifies one of said select interactive interface operating formats from said plurality of interactive interface operating formats;

cue means for providing cues during said calls received by said first response unit means to prompt responses from callers during said calls in the form of interactively entered data;

qualification means for qualifying on-line said calls received by said first response unit means to provide qualified calls based on testing said interactively entered data against other data stored in a memory;

second response unit means for receiving calls in said toll free call mode wherein digital signals indicative of at least one other of said plurality of called numbers identifies another of said select interactive interface operating formats from said plurality of interactive interface operating formats;

means for processing said qualified calls received by said first response unit means and other calls in said toll free call mode received by said second response unit means in accordance with at least certain common operations of said select interactive interface operating formats; and

a control unit coupled to said voice generator for providing a preliminary automated voice prompt to cue callers to interactively enter data under control of said digital signals (DNIS) to callers calling at least one of said plurality of distinct numbers prior to execution of said common operations of said select interface formats.

179. A telephone call processing system according to claim **178** wherein said digital signals (DNIS) are indicative of at least two different numbers dialed by callers to access said select interactive interface formats, at least one of said numbers associated with a toll free call mode wherein calls to at least said number associated with said toll free call mode require qualification of said callers based on data provided by said callers against data on said callers stored in a memory means.

180. A telephone call processing system according to claim **178**, wherein digital signals representing calling terminal numbers associated with at least certain of said multitude of terminals are automatically provided from said telephonic communication facility.

181. A telephone call processing system according to claim **180**, further comprising:

means for storing digital signals representing calling terminal numbers associated with said multitude of terminals, automatically provided from said telephonic communication facility.

182. A telephone call processing system according to claim **178**, wherein said qualification means tests at least certain of digital signals representing calling terminal numbers associated with said multitude of terminals, automatically provided from said telephonic communication facility.

183. A telephone call processing system according to claim **178**, wherein digital signals representing calling terminal numbers associated with said multitude of terminals automatically provided from said telephonic communication facility are used to access a data bank relating to callers.

184. A telephone call processing system according to claim **178**, wherein said means for processing processes data provided by callers to update a databank relating to said callers.

185. A telephone call processing system according to claim **178**, wherein said qualification means qualifies on-line said calls based upon a limit on use.

28

186. A telephone call processing system according to claim **178**, wherein said interactively entered data comprises caller pin-number data which is subject to limited use.

187. A telephone call processing system according to claim **186**, wherein said data including caller PIN number data is further subject to said limited use during a limited period of time based upon entitlement.

188. A telephone call processing system according to claim **178**, further comprising a limited use test for said interactively entered data comprising a one time only use test.

189. A telephone call processing system according to claim **178**, further comprising:

memory means for storing said interactively entered data and control means for restricting the extent of access to said system based on at least one of said interactively entered data or calling terminal data automatically provided by said telephonic communication facility.

190. A telephone call processing system according to claim **178**, wherein said select interactive interface formats are associated with an information service.

191. A telephone call processing system according to claim **178**, wherein said select interactive interface formats provide financial information for stocks and bonds.

192. A telephone call processing system according to claim **178**, further comprising:

a third response unit means for receiving calls in a caller charge mode.

193. A telephone call processing system according to claim **178**, wherein said interactively entered data provided by callers as qualification data is indicative of a caller PIN number and said caller PIN number facilitates participation during a limited period of time.

194. A telephone call processing system according to claim **193**, wherein said PIN number is provided to the caller via mail.

195. A telephone call processing system according to claim **194**, wherein said PIN number is associated with a product.

196. A telephone call processing system according to claim **178**, wherein said caller provides identification data and other data in addition to said interactively entered data for qualification.

197. A telephone call processing system according to claim **178**, further comprising:

voice generator means for prompting callers with at least one question upon receiving calling terminal numbers associated with said multitude of terminals, automatically provided by said telephonic communication facility.

198. A telephone call processing system according to claim **178**, further comprising:

a third response unit for receiving calls in an area code mode.

199. A telephone interface system for individually interfacing callers at a multitude of remote terminals for voice-digital communication through a telephone communication facility, said system comprising:

communication means for establishing telephone communication between callers at certain of said multitude of remote terminals and a select interactive operating format through said telephone communication facility based on digital signals indicative of at least one of a plurality of distinct numbers dialed by callers (DNIS) to select said select interactive operating format from a plurality of operating formats;

5,828,734

29

means for providing identification signals received relating to said callers in accordance with said select interactive operating format to said communication means indicative of currently active of said identification signals relating to said callers;

memory means for storing one or more caller cues and use indications for said caller cues in relation to said currently active of said callers as identified by said identification signals;

cue means for receiving said caller cues to provide responses from said currently active callers in the form of digital data signals;

means for selecting a caller cue from said memory means for said currently active caller for application to said cue means under control of said identification signals and said use indications stored in said memory means for said currently active caller whereby to limit and control caller cues provided to individual callers based upon cues previously provided to and identified with said identification signals relating to said individual callers; and

connection means for selectively connecting calls using two select distinct numbers of said plurality of distinct numbers to common operations of said select interactive operating format and another select interactive operating format, wherein digital signals (DNIS) indicative of said two select distinct numbers identify said select interactive operating format and said another select operating format.

200. A telephone interface system according to claim 199, wherein said plurality of distinct numbers dialed by callers are associated with different call modes including a toll free call mode and a caller charge call mode.

201. A telephone interface system according to claim 199, further comprising:

qualification means for qualifying on-line said calls for at least one of said called numbers.

202. A telephone interface system according to claim 199, further including memory means for storing data and control means for restricting the extent of access to said system based on at least one of caller provided data or a calling terminal number automatically provided by a communication facility.

203. A telephone interface system according to claim 199, wherein said identification signals relating to said individual callers include digital signals representing calling terminal numbers associated with at least certain of said multitude of remote terminals automatically provided by said communication facility.

204. A telephone interface system according to claim 203, further comprising:

means for storing at least certain of said digital signals representing calling terminal numbers associated with said certain of said multitude of remote terminals, automatically provided by said communication facility.

205. A telephone interface system according to claim 199, wherein said caller cues are limited and controlled to avoid duplication of certain of said cues.

206. A telephone interface system according to claim 199, further comprising:

means for receiving digital signals representing calling terminal numbers associated with at least certain of said multitude of remote terminals automatically provided from a communication facility.

207. A telephone interface system according to claim 190, further comprising: qualification means for testing digital

30

signals representing calling terminal number data associated with said multitude of remote terminals, automatically provided from a communication facility.

208. A telephone interface system according to claim 199, wherein digital signals representing calling terminal numbers associated with said multitude of remote terminals automatically provided from a communication facility are used to access a data bank relating to callers.

209. A telephone interface system according to claim 208, wherein said select interactive operating format is identified from a plurality of formats by said plurality of called numbers (DNIS).

210. A telephone interface system according to claim 199, wherein said select operating format is selected from a plurality of operating formats under control of said digital signals indicative of said plurality of distinct numbers dialed by callers (DNIS).

211. A telephone interface system according to claim 199, wherein said callers provide PIN number data as further identification data.

212. A telephone interface system according to claim 199, wherein said identification signals are used to access a databank relating to said callers.

213. A telephone interface system according to claim 199, further comprising:

qualification means for testing said identification signals indicative of said currently active of said callers.

214. A telephone interface system according to claim 213, wherein said qualification means tests said identification signals based upon limited use.

215. A telephone interface system according to claim 214, wherein said identification signals include caller PIN number signals which are further tested subject to said limited use during a limited period of time based upon entitlement.

216. A telephone interface system according to claim 199, wherein said memory means further stores data provided by callers to update said memory means.

217. A telephone interface system according to claim 199, wherein said select interactive operating format relates to an information service.

218. A telephone interface system according to claim 199, wherein said select interactive operating format relates to financial information.

219. A telephone interface system according to claim 199, wherein said select interactive operating format involves advertising of a product for sale.

220. A telephone interface system according to claim 199, further comprising:

connection means for selectively connecting calls from at least two of said plurality of distinct numbers dialed by callers to common operations of said interface format.

221. A telephone interface system according to claim 199, wherein said at least two of said plurality of distinct numbers dialed by said callers are "900" numbers.

222. A telephone interface system according to claim 221, wherein said qualification means performs a test with respect to said identification signals based upon a limit on use.

223. A telephone interface system according to claim 199, wherein said caller cues are limited and controlled to avoid duplication of certain of said cues.

224. A telephone interface system according to claim 190, wherein said two select toll free numbers dialed by said callers are two "800" numbers.

225. A telephone interface system according to claim 199, wherein at least two of said plurality of distinct numbers dialed by said callers are two "900" numbers.

5,828,734

31

226. A telephone interface system according to claim **199**, wherein said caller cues are limited and controlled to avoid duplication of certain of said cues.

227. A telephone interface system according to claim **199**, wherein said select operating format is selected from a plurality of operating formats under control of said digital signals indicative of said plurality of distinct numbers dialed by callers (DNIS).

228. A telephone interface system according to claim **199**, further comprising:

qualification means performs a test with respect to said identification signals based upon a limit on use.

229. A telephone interface system according to claim **199**, further comprising:

audio control unit for providing a preliminary automated greeting under control of said digital signals (DNIS) to callers calling at least one of said two select toll free numbers prior to execution of said common processing operations of said select interactive operating format and said another interactive select operating format.

230. A telephone call processing system for individually interfacing callers at a multitude of remote terminals for voice-digital communication through a telephone communication facility, said system comprising:

communication means for establishing telephone communication between callers at certain of said multitude of remote terminals and select interactive operating formats through said telephone communication facility based on digital signals indicative of select called numbers dialed by callers (DNIS) to identify said select interactive operating formats from a plurality of interactive operating formats, wherein at least two select called numbers are associated with a pay to dial call mode and a second call mode for accessing said select interactive interface formats;

audio control unit coupled to said communication means for providing preliminary automated greetings to callers calling in both said pay to dial and said second call modes, each of said preliminary automated greetings distinct from the other and controlled at least in part by said DNIS signals; qualification means for qualifying on-line calls received in at least one of said pay to dial call mode and said second call mode; and

connection means for connecting substantially all of said callers calling in said two call modes including qualified calls received in at least one of said pay to dial call mode and said second call mode and other calls received in said two call modes to common processing operations of said select interactive operating formats.

231. A telephone call processing system according to claim **230**, wherein digital signals representing calling terminal numbers associated with at least certain of said multitude of remote terminals are automatically provided from a communication facility.

232. A telephone call processing system according to claim **231**, further comprising:

means for storing digital signals representing calling terminal numbers associated with said multitude of remote terminals, automatically provided from a communication facility.

233. A telephone call processing system according to claim **230**, further comprising:

means for receiving digital signals representing calling terminal numbers associated with at least certain of said multitude of remote terminals automatically provided from a communication facility.

32

234. A telephone call processing system according to claim **230**, wherein said qualification means tests digital signals representing calling terminal numbers associated with at least certain of said multitude of remote terminals, automatically provided from a communication facility.

235. A telephone call processing system according to claim **234**, wherein said qualification means tests for a use limit.

236. A telephone call processing system according to claim **230**, wherein digital signals representing calling terminal numbers associated with at least certain of said multitude of remote terminals automatically provided from a communication facility are used to access a data bank relating to callers.

237. A telephone call processing system according to claim **230**, wherein said second mode is a toll free call mode and said pay to dial mode is a "900" call mode.

238. A telephone call processing system according to claim **230**, further comprising:

qualification structure to qualify callers on-line calling in said second mode as a condition to be connected to said common processing operations.

239. A telephone call processing system according to claim **238**, wherein said qualification structure qualifies on-line said callers based on a caller entered pin number.

240. A telephone call processing system according to claim **239**, wherein said pin number is tested for limited use.

241. A telephone call processing system according to claim **240**, further comprising:

means for providing identification signals to said qualification structure indicative of currently active of said callers;

memory means for storing one or more caller cues and use indications for said caller cues in relation to said currently active of said callers as identified by said identification signals;

cue means for coupling said caller cues to said voice generator to provide responses from said currently active callers in the form of digital data signals; and

means for selecting a caller cue from said memory means for said currently active caller for application to said cue means under control of said identification signals and said use indications stored in said memory means for said currently active caller whereby to limit and control caller cues provided to individual callers based upon cues previously provided to and identified with said individual callers.

242. A telephone call processing system according to claim **230**, further comprising:

voice generator means for prompting callers whereby callers enter data in response to voice prompts.

243. A telephone call processing system according to claim **242**, further comprising:

means for processing to isolate a subset of callers based upon data entered by said callers responsive to prompting by said voice generator means and wherein said means for processing further isolates a sub-subset of callers also responsive to further data entered by said callers responsive to further prompting by said voice generator means.

244. A process for receiving calls from a multitude of terminals in different call modes including a toll free call mode and a "900" caller charge call mode and processing to respective interactive interface formats for said different call modes, wherein the process involves digital signals provided by said multitude of terminals as for identification or data, comprising the steps of:

5,828,734

33

receiving calls in said toll free call mode;
 providing a limited-use pin number by mail to facilitate
 toll free participation via said toll free call mode;
 qualifying said calls on-line in said toll free call mode
 based on said limited-use pin number to provide qual-
 ified calls;
 receiving calls in said "900" caller charge call mode; and
 coupling said qualified calls and said calls in said caller
 charge mode for concurrent processing to common
 operations of said respective interactive interface for-
 mats.

245. A process for receiving calls according to claim **244**,
 further comprising:

receiving digital signals indicative of a number dialed by
 callers at said multitude of terminals (DNIS) provided
 by a communication facility to identify each of said
 respective interactive interface formats selected from a
 plurality of distinct interactive operating interface for-
 mats.

246. A process for receiving calls according to claim **206**,
 wherein said limited-use pin number is coded for verifica-
 tion.

247. A process for receiving calls according to claim **244**,
 wherein use of said limited use pin number is further limited
 to a period of time.

248. A process for receiving calls according to claim **244**,
 wherein said toll free call mode is an "800" call mode.

249. A process for receiving calls from a multitude of
 terminals in different call modes including a toll free call
 mode and a "900" caller charge call mode and processing to
 respective interactive interface formats for said different call
 modes, wherein the process involves digital signals provided

34

by said multitude of terminals as for identification in the
 form of a pin number or other data, comprising the steps of:
 receiving calls in said toll free call mode;

providing said pin number to facilitate toll free partici-
 pation via said toll free call mode during a limited
 period of time;

qualifying said calls on-line in said toll free call mode
 based on said pin number to provide qualified calls;

receiving calls in said "900" caller charge call mode; and
 coupling said qualified calls and said calls in said caller
 charge mode for concurrent processing to common
 operations of said respective interactive interface for-
 mats.

250. A process for receiving calls according to claim **249**,
 wherein said pin number is a limited-use pin number.

251. A process for receiving calls according to claim **250**,
 wherein said limited-use pin number is coded for verifica-
 tion.

252. A process for receiving calls according to claim **249**,
 further comprising:

receiving digital signals indicative of a number dialed by
 callers at said multitude of terminals (DNIS) automati-
 cally provided by a communication facility to identify
 each of said respective interactive interface formats
 selected from a plurality of distinct interactive operat-
 ing interface formats.

253. A process for receiving calls according to claim **249**,
 wherein said pin number is provided by mail.

254. A process for receiving calls according to claim **249**,
 wherein said toll free call mode is an "800" call mode.

* * * * *

EXHIBIT 9

United States Patent [19]
Katz

[11] **Patent Number:** **5,898,762**
[45] **Date of Patent:** ***Apr. 27, 1999**

[54] **TELEPHONIC-INTERFACE STATISTICAL ANALYSIS SYSTEM**

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[75] Inventor: **Ronald A. Katz**, Los Angeles, Calif.

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[73] Assignee: **Ronald A. Katz Technology Licensing, L.P.**, Beverly Hills, Calif.

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[*] Notice: This patent is subject to a terminal disclaimer.

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[21] Appl. No.: **08/471,420**

[22] Filed: **Jun. 6, 1995**

Related U.S. Application Data

[62] Division of application No. 07/335,923, Apr. 10, 1989, which is a continuation of application No. 07/194,258, May 16, 1988, Pat. No. 4,845,739, which is a continuation-in-part of application No. 07/018,244, Feb. 24, 1987, Pat. No. 4,792,968, which is a continuation-in-part of application No. 06/753,299, Jul. 10, 1985, abandoned.

Primary Examiner—Stella Woo

Attorney, Agent, or Firm—Lyon & Lyon LLP

[51] **Int. Cl.**⁶ **H04M 11/00**

[57] **ABSTRACT**

[52] **U.S. Cl.** **379/93.12; 379/91.01**

[58] **Field of Search** 379/92, 91, 94,
379/93, 96, 97, 98, 88, 89, 91.01, 91.02,
92.01, 93.01, 93.12, 93.13, 93.26

A system D interfaces with a multiplicity of individual terminals T1-Tn of a telephone network facility C, at the terminals callers are prompted by voice-generated instructions to provide digital data that is identified for positive association with a caller and is stored for processing. The caller's identification data is confirmed using various techniques and callers may be ranked and accounted for on the basis of entitlement, sequence or demographics. Callers are assigned random designations that are stored along with statistical and identification data. A break-off control circuit may terminate the computer interface aborting to a terminal for direct communication with an operator. Real-time operation processing is an alternative to stored data. The accumulation of stored data (statistical, calling order sequence, etc.) is variously processed and correlated as with developed or established data to isolate a select group or subset of callers who can be readily identified and reliably confirmed. Different program formats variously control the processing of statistical data as for auction sales, contests, lotteries, polls, commercials and so on.

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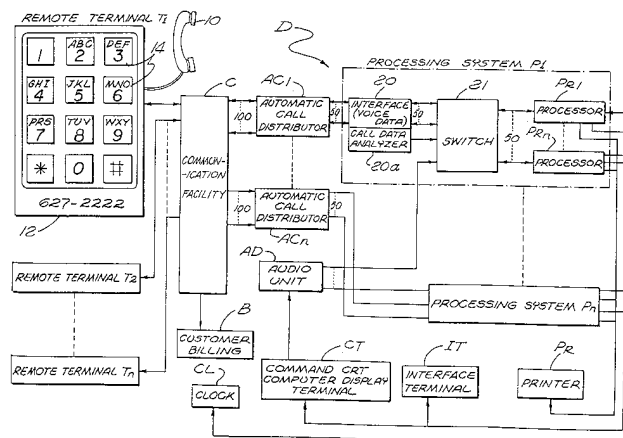
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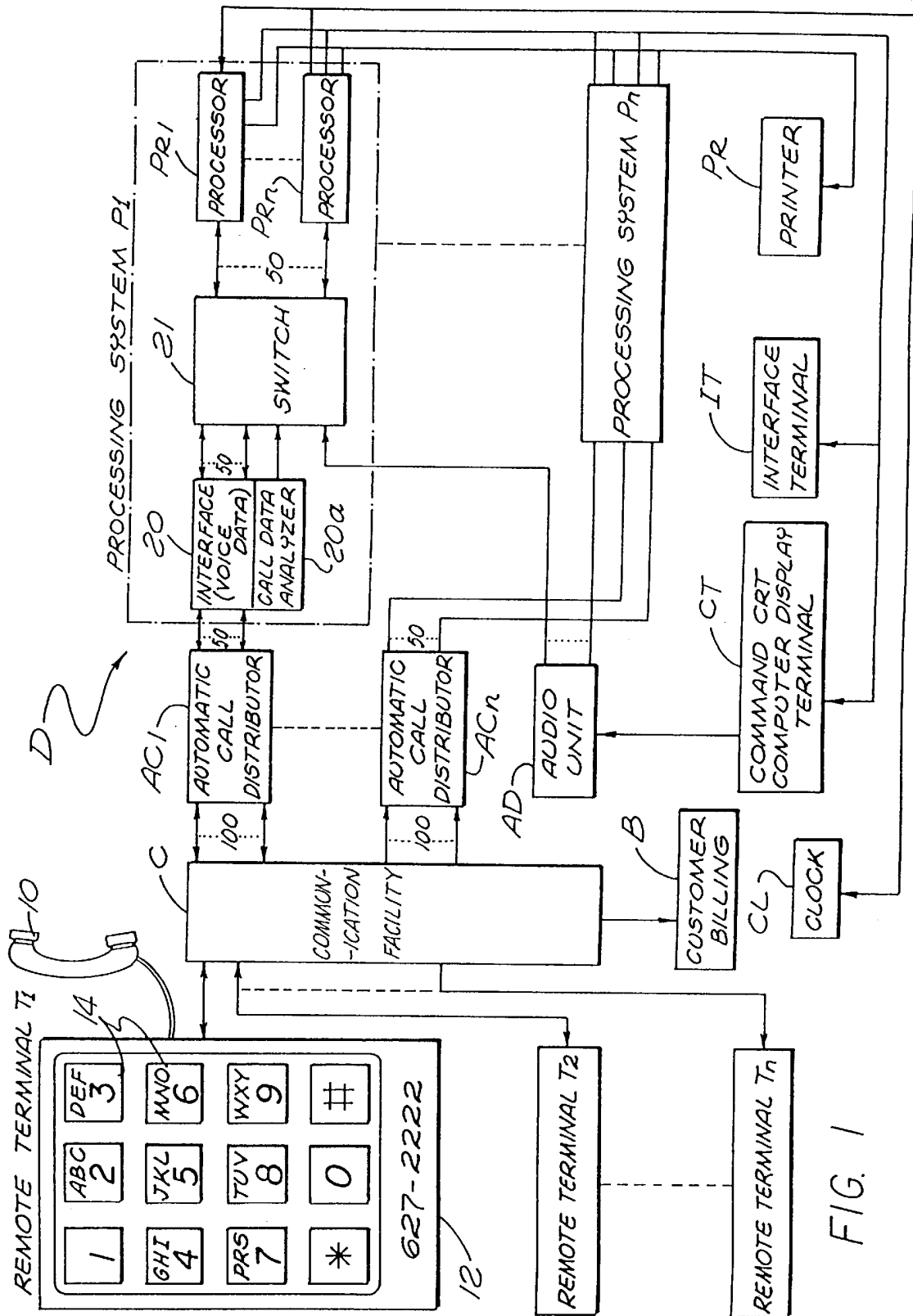
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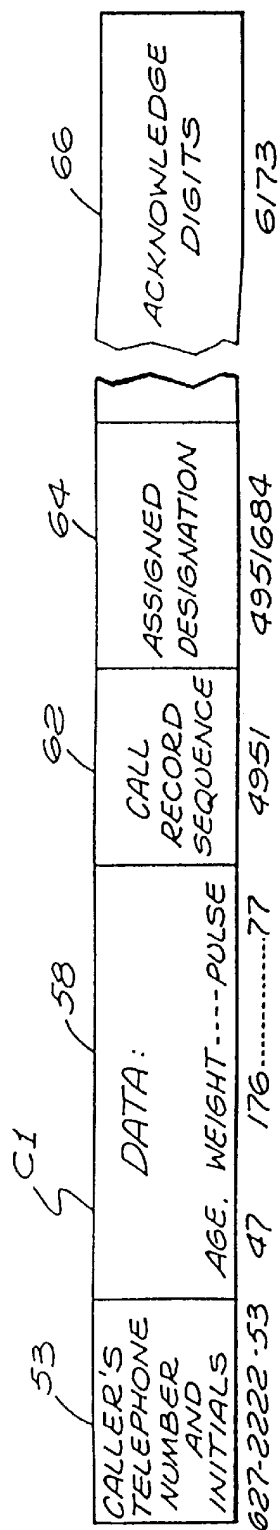


FIG. 2

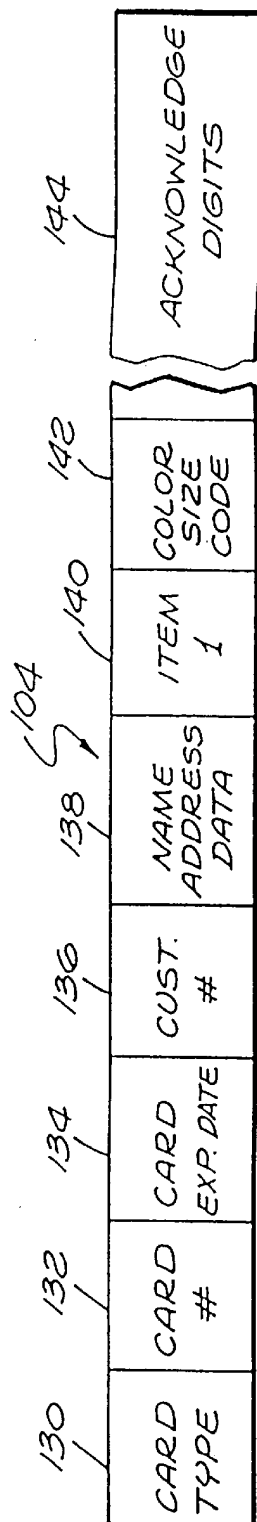


FIG. 5

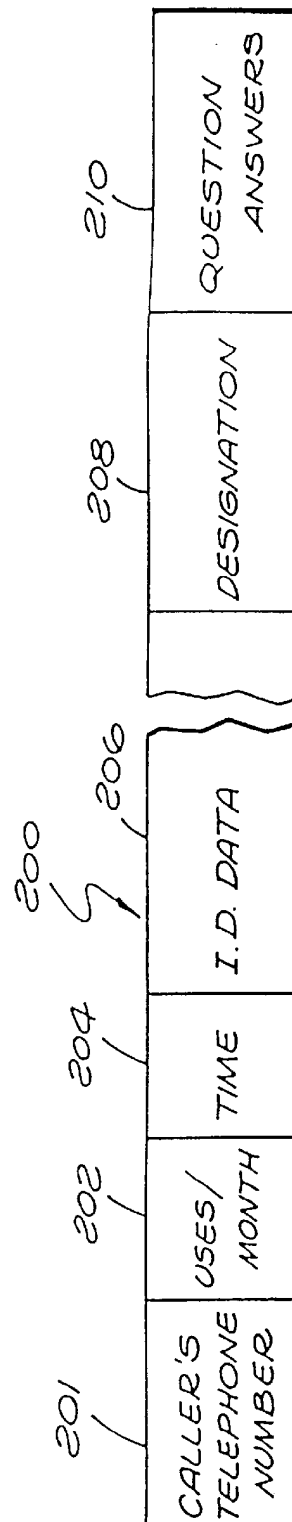


FIG. 7

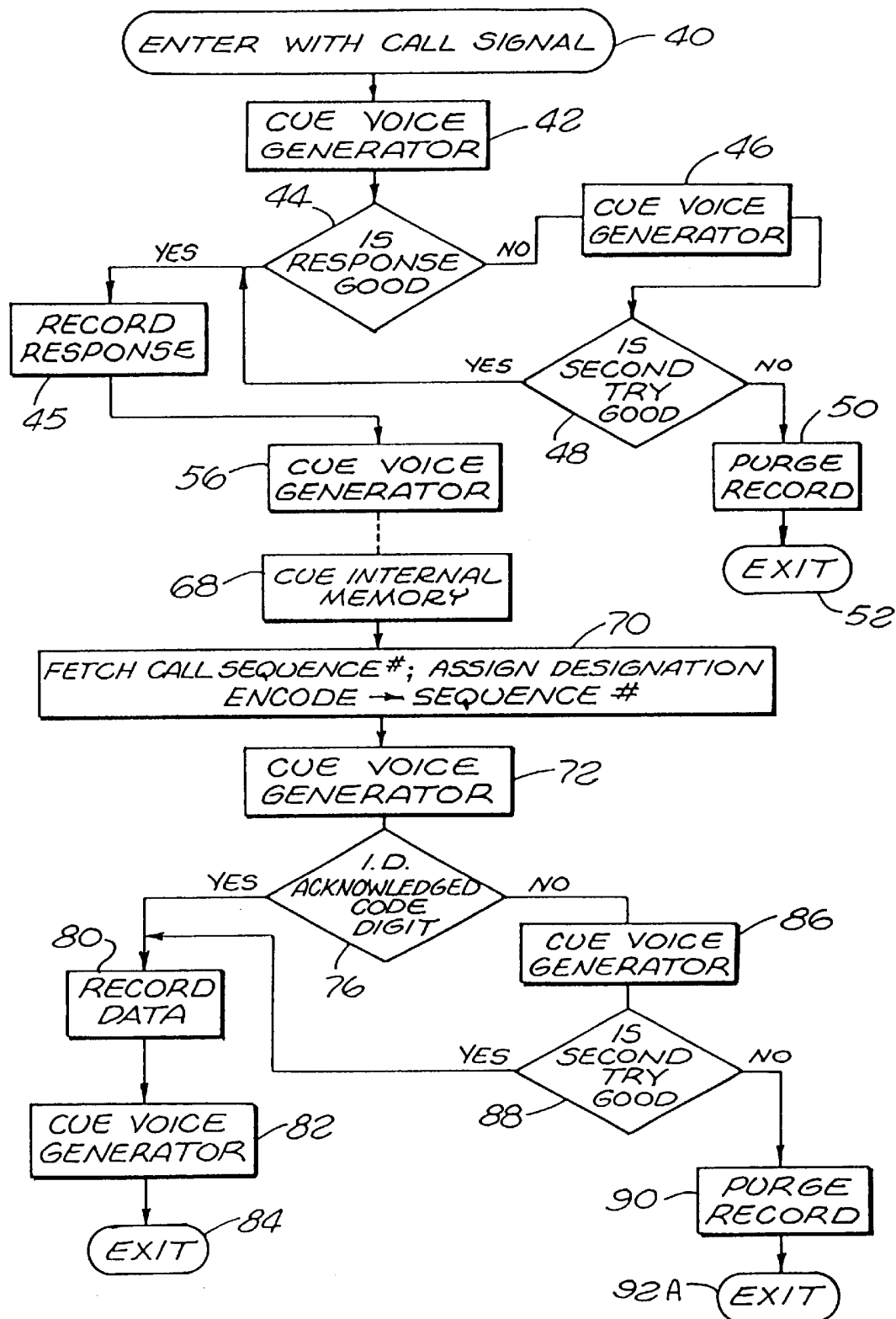


FIG. 3

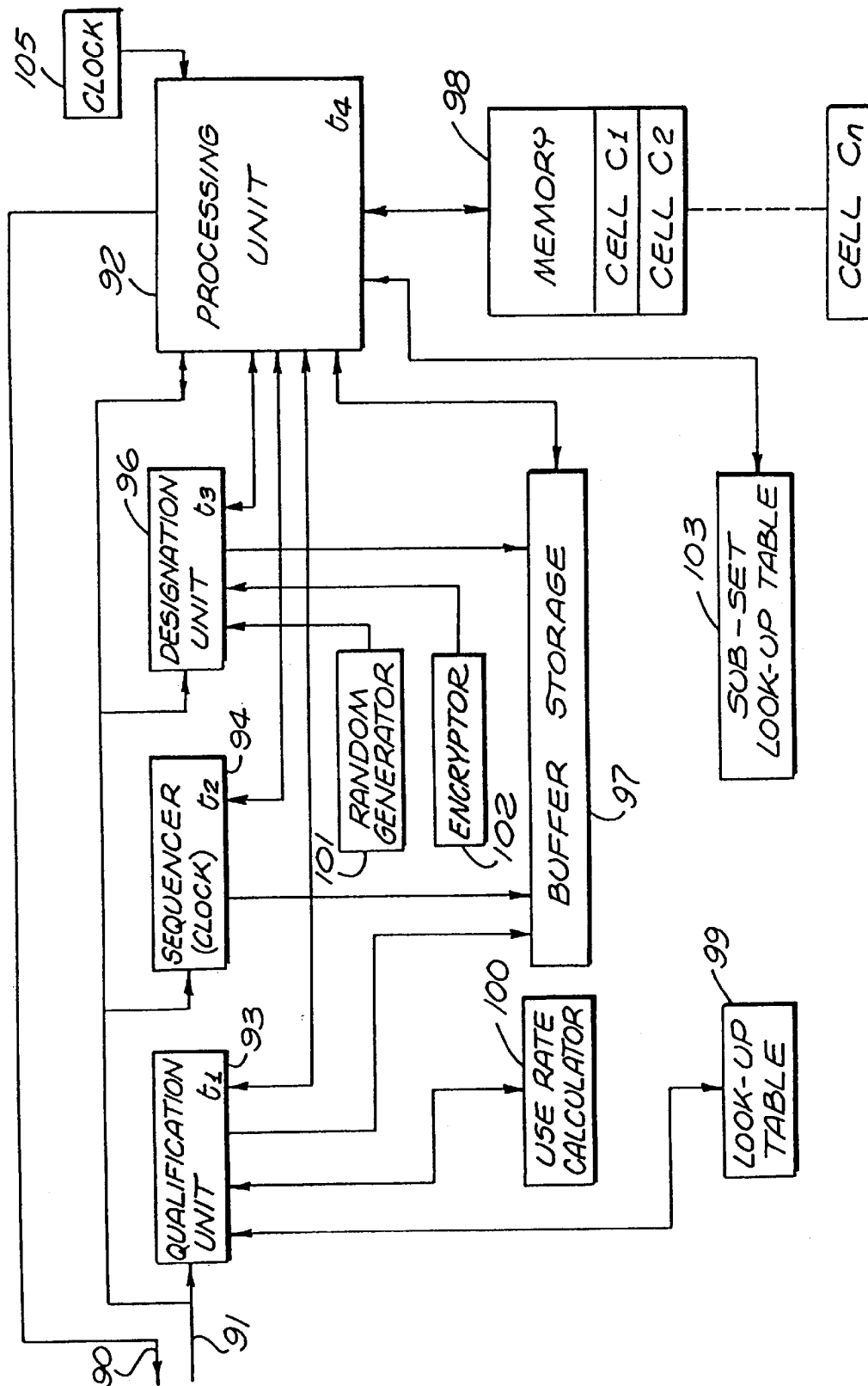


FIG. 4

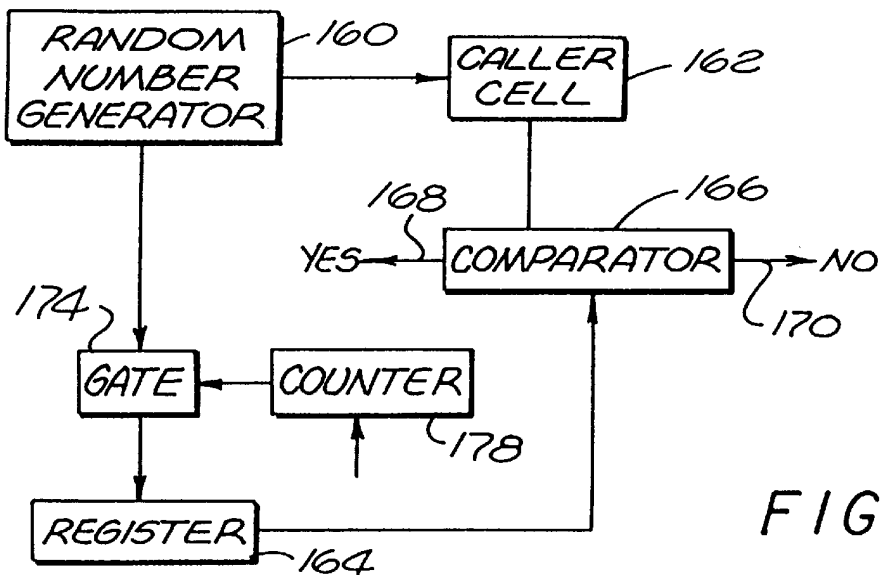


FIG. 6

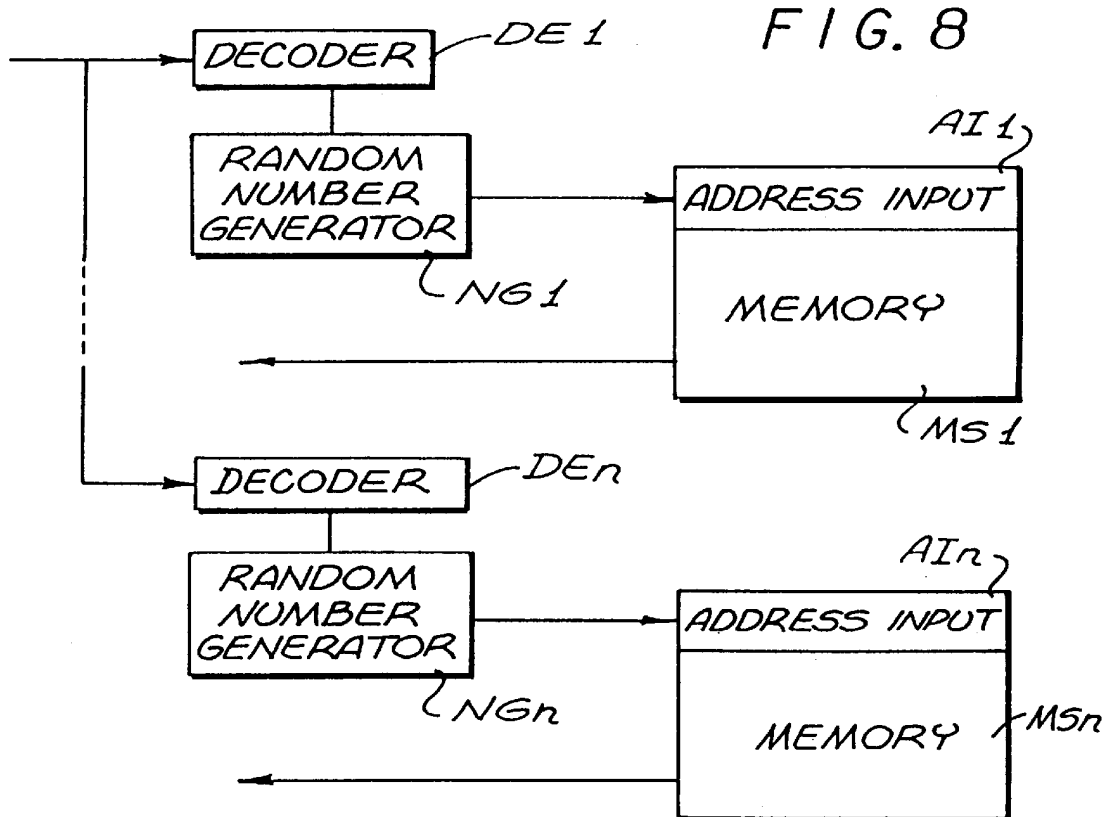
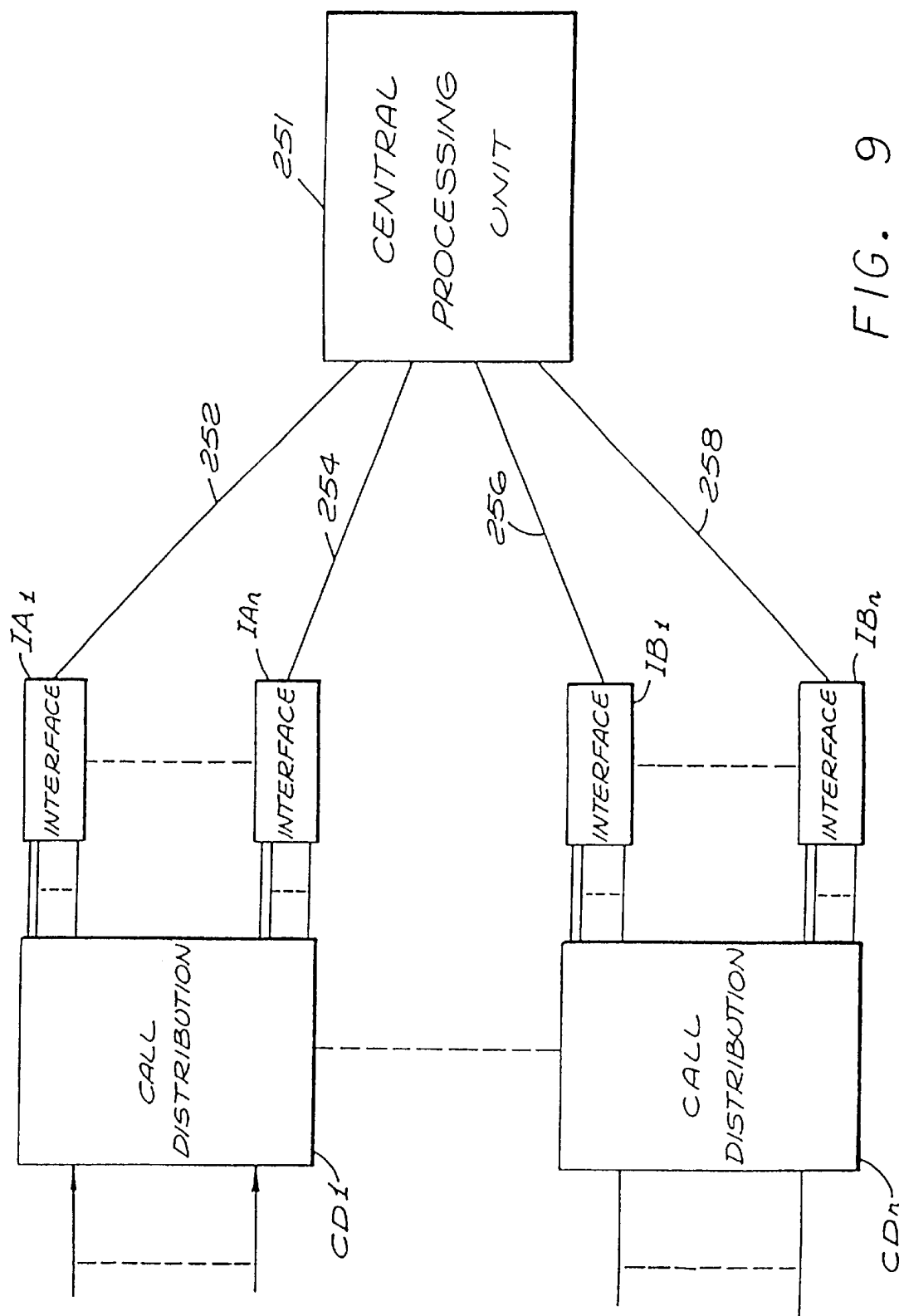


FIG. 8



5,898,762

1

TELEPHONIC-INTERFACE STATISTICAL ANALYSIS SYSTEM

BACKGROUND AND SUMMARY OF THE INVENTION

This is a divisional application of application Ser. No. 07/335,923 filed Apr. 10, 1989, and entitled "Telephonic-Interface Statistical Analysis System", which was a continuation of application Ser. No. 07/194,258 filed May 16, 1988, and entitled "Telephonic-Interface Statistical Analysis System", now U.S. Pat. No. 4,845,739, which is a continuation-in-part of application Ser. No. 07/018,244 filed Feb. 24, 1987, and entitled "Statistical Analysis System For Use With Public Communication Facility", now U.S. Pat. No. 5,792,968, which was a continuation-in-part of application Ser. No. 06/753,299 filed Jul. 10, 1985, abandoned, and entitled "Statistical Analysis System For Use With Public Communication Facility".

Various forms of publicly accessible communication systems for providing access to a central station have been proposed, some involving telecommunications. However, sometimes a need for ancillary functions arise in that regard, e.g. it may be desirable to positively identify a large group of persons, as a demographically controlled group, or a specifically entitled group, then statistically analyze data from the group so as to accurately identify certain persons in the group and select a subset of at least one person. Specifically, it may be desirable to obtain medical data from an entitled group of people, to correlate such data, perhaps introduce external data, then identify a select subset of the group. In that regard, a need exists for an improved, effective, economical, and expedient system of telecommunication incorporating means for performing qualification, identification, analysis and selection of individual persons.

It has been proposed to interface persons at telephone calling stations directly with a computer facility. In accordance with such arrangements, recorded voice messages prompt callers to provide data by actuating the alphanumeric buttons that are conventionally employed for dialing from one telephone station to another. In one prior arrangement, a caller may actuate dialing buttons to selectively attain a communication channel or to address specific information in a computer. In another arrangement, dialing buttons may be actuated to specify a billing designation as for requested services. Generally, such systems are believed to have been somewhat limited in scope, often involving difficulties that are frustrating or confusing to a caller. Nevertheless, such techniques have been widely used to enhance and broaden communication.

In general, the present invention comprises a telephonic-interface system and related process for selectively utilizing both analog (voice) and digital telephonic communication in a variety of different interface formats or programs, as to select or qualify a set of callers, enable positive identification of at least certain of the callers in the set, acquire data from callers in the set, statistically analyze acquired data, as in combination and in association with external data (time independent), and accordingly to isolate a subset of the callers with verifiable identification. That is, the external data (separate from caller-provided data) may be introduced at any of a variety of different times in relation to the caller data.

For example, a voice origination apparatus may prompt individual callers who (after qualification) provide select digital data to develop a record for further processing either immediately, upon the evolution of a defined set of callers or

2

upon the establishment of select external data. Thus, following a qualification phase, the information acquisition phase may be concurrent or consecutive with respect to the processing phase. When appropriate, abort capability allows a caller to remain "off hook" and go to analog (vocal) communication. The caller then interfaces directly with an operator.

The system of the present invention may qualify an entitled set of callers, then receive answer data in the course of the call and develop identification or designation data, sequence data and statistical data. The system may then provide data cells for storing individual data while assigning confirmable identifications to the entitled set. From the set, a subset is defined. That is, in accordance with various formats, acquired data is processed in statistical relationship, or in relation to applied external data to accomplish such functional operating formats as an auction sale, a contest, a lottery, a poll, a merchandising operation, a game, and so on.

A variety of memory techniques are used to selectively activate the voice origination apparatus. Accordingly, statistical analysis and selection can be effectively and economically accomplished with respect to a substantial set of callers who are accommodated individual communication through a telephone system.

BRIEF DESCRIPTION OF THE DRAWINGS

In the drawings, which constitute a part of this specification, exemplary embodiments exhibiting various objectives and features hereof are set forth, specifically:

FIG. 1 is a block diagram of a system constructed in accordance with the present invention;

FIG. 2 is a fragmentary diagrammatic representation of a storage cell format as may be developed in the system of FIG. 1;

FIG. 3 is a flow diagram of one operating format of the system of FIG. 1;

FIG. 4 is a block diagram of a form of processor or function unit as may be employed in the system of FIG. 1;

FIG. 5 is a fragmentary diagrammatic representation of a storage cell format as may be developed in the system of FIG. 1 with the processor of FIG. 4;

FIG. 6 is a block diagram of elements in an operating function unit of FIG. 4;

FIG. 7 is a diagrammatic representation of a storage cell format as may be developed in the system of FIG. 4; and

FIG. 8 is a block diagram of elements in an operating function unit of FIG. 4.

FIG. 9 is a block diagram of the connections between the CPU and remote stations.

DESCRIPTION OF THE ILLUSTRATIVE EMBODIMENTS

As required, detailed illustrative embodiments of the present invention are disclosed herein. However, physical communication systems, data formats, and operating structures in accordance with the present invention may be embodied in a wide variety of forms, some of which may be quite different from those of the disclosed embodiments. Consequently, the specific structural and functional details disclosed herein are merely representative; yet in that regard, they are deemed to afford the best embodiments for purposes of disclosure and to provide a basis for the claims herein which define the scope of the present invention.

Referring initially to FIG. 1, a series of remote telephone-instrument terminals T1 through Tn are represented (left).

5,898,762

3

The terminals are generally similar, and accordingly, only the terminal T1 is illustrated in detail.

In the disclosed embodiment, the remote terminals Ti through Tn represent the multitude of conventional telephone terminals that are coupled to a communication facility C which may take the form of a comprehensive public telephone system for interconnecting any associated terminals T1-Tn. In accordance with the present system, the terminals T1-Tn operate through the communication facility C to be coupled with a central station D, an embodiment of which is illustrated in some detail.

Generally in accordance with the present development, individual callers use the individual telephone stations T1 through Tn to interface the station D through the communication facility C. Callers may be screened or qualified. Also in accordance herewith, the data of individual callers may be collected, correlated and tested in the station D for processing in accordance with various programs and external data. As a consequence, various objectives are accomplished. For example, a select subset of the callers may be isolated and specifically identified, or related data may be processed, or transactions may be actuated. The possibilities for application of the system are substantial and varied as will be apparent from the exemplary structure and functions as described in detail below.

In one operating process format, the public might be polled with regard to locating the specific purchasers of a defective or dangerous product. Alternatively, the public might be polled with the objective of locating persons susceptible to a specific ailment or disease. Public auctions of unprecedented participation are possible. Legal lotteries are enabled that are interesting, effective and very economical on an individual participant basis. The system also might be employed in various game formats or to automate a promotion or mail-order operation, even to the extent of including inventory control as detailed below.

In each functional operating format, the callers may be variously qualified on the basis of entitlement and may be identified for subsequent verification. The callers then may be prompted, either through the interface or externally, to provide appropriate data.

Considering the system of FIG. 1 in somewhat greater detail, it is to be understood that the communication facility C has multiplexing capability for individually coupling the terminals T1-Tn to the central station D on request. In the illustrative embodiment of the system, the communication facility C comprises a public telephone network and the individual terminals T1-Tn take the various forms of existing traditional or conventional telephone instruments.

The exemplary telephone terminal T1 is represented in some detail to include a hand piece 10 (microphone and earphone) and a panel 12 provided with a rectangular array of push buttons 14 in the conventional configuration. Of course, the hand piece 10 accommodates analog signals while the panel 12 is a digital apparatus. Generally in accordance herewith, the hand piece 10 serves to manifest analog signals vocally to the caller.

In accordance with conventional telephone practice, alphabetic and numeric designations are provided on the buttons 14. For example, several of the buttons 14 carry three letters along with a decimal digit. Specifically, the button designated with the numeral "2" also carries the letters "A", "B" and "C". In that manner, the buttons 14 encompass the numerals "0-9", two symbols, and the alphabet except for the letters "Q" and "Z". Consequently, the buttons 14 accommodate the entry of decimal data, and to some extent alphabetic data.

4

The buttons 14 designated with symbols "*" and "#", along with the numeral "0", can be used by predetermined assignment to represent the letters "Q" and "Z" or any of a variety of other data or command components. Generally, in accordance herewith, the buttons 14 are employed to formulate digital data at the central station D in various formats determined by the instant specific use and operating format of the system.

Considering the central station D in somewhat greater detail, the communication facility C is coupled to interface a series of processing systems P1 through Pn (FIG. 1, left). Specifically, the communication facility C is connected to the processing systems P1-Pn through an associated series of automatic call distributors AC1 through ACn. Each of the automatic call distributors AC1-ACn accommodates one hundred lines from the communication facility C and accordingly, may accommodate and queue up to 100 calls.

Each of the automatic call distributors AC1-ACn may take various forms as well known in the prior art, functioning to queue incoming calls for connection to a lesser number of lines. In the disclosed embodiment, from each of the call distributors AC1-ACn, fifty lines are connected respectively to the individual data processing systems P1-Pn through an interface 20 and a switch 21. Thus, in the disclosed embodiment, each of the automatic call distributors AC1-ACn can accommodate one hundred lines, fifty of which may be active in association with one of the processing systems P.

The processing systems P1-Pn are similar, therefore, only the processing system P1 is shown in any detail. Collectively, the processing systems P1-Pn are interconnected with a command computer terminal CT, at least one interface terminal IT, at least one printer PR and an audio unit AD. The command terminal CT is separately coupled to the audio unit AD.

As represented, the processing systems P1 through Pn each contain a number of individual function units or processors PR1 through PRn. Although various other configurations and arrangements may be employed, the explanation is facilitated by including a plurality of individual function units as treated in detail below.

Considering the processing system P1, fifty lines from the automatic call distributor AC1 are connected to the interface 20, an exemplary form of which may be a commercially available Centrum 9000 unit. The interface 20 incorporates modems, tone decoders, switching mechanisms, DNIS and ANI capability (call data analyzer 20a) along with voice interface capability. Note that the interface may actually perform analysis on data. However, to preserve the disclosed embodiment manageable, major analysis is explained with reference to processors.

Generally, DNIS capability is a function of the communication facility C (composite telephone system) to provide called terminal digital data indicating the called number. ANI capability is a similar function whereby the digital data indicates the calling number with calling terminal digital signals. Both capabilities are available for use with equipment as the interface 20 and to provide control through the call data analyzer 20a.

Accommodating up to fifty independent calls on separate communication paths to the central station D, the interface 20 is capable of providing analog (voice) signals to prompt each caller. Also accommodated are digital signals including the DNIS and ANI signals. The system contemplates the possibility of utilizing sequences of lines in rotary as well as blocking sequences of lines, the numbers for which com-

5,898,762

5

mand a particular program or operation format of a function unit as disclosed in detail below.

The interface **20** provides the connection of the fifty lines to a switch **21** which is in turn coupled to fifty function units, or processors **PR1-PRn**. As indicated above, multiple function units, or processors, are described in the disclosed embodiment to facilitate the explanation. Of course, non-parallel techniques and multiplexed operations might well be employed as alternatives. For a similar reason, as disclosed herein, each of the processors **PR1-PRn** includes memory cells for each of the callers' individual data. Development and compilation of data in such cells according to various operating formats is described below. In the disclosed embodiment, the processors **PR1-PRn** are connected collectively to the command computer terminal **CT** (incorporating a CRT display), the interface terminal **IT**, and the printer **PR**. Note that the CRT display serves to visually display data regarding select subsets as explained in detail below.

Exemplary detailed structures for the processors **PR1-PRn** are described below; however, in general, the units may comprise a microcomputer, for example, programmed as suggested above and as disclosed in detail below to accomplish specific operating formats. As an integral part of such formats, a caller may be qualified as belonging to an entitled set of persons or to accommodate specific demographic objectives. Also, callers may be designated both with respect to their significance and their identification. For example, callers may have different significance in a format, depending on the time or sequence of their call. Also, the designation of a caller may be exceedingly important in relation to the caller eventually being isolated as part of a subset, the members of whom must be accurately verified. As described below, the designations may involve multiple elements which may include: random number assignments, encryption techniques, utilization of calling numbers, identification data, sequence of call and so on to facilitate reliable verification. Note that the communication facility **C** has a customer billing structure **B** that is interfaced by the system.

On the qualification and designation of callers, the system enters a data accumulation phase during which digital data (formatted at one of the telephone terminals **T1-Tn**) is processed by one of the processors **PR1-PRn**. In general, the processing evolves a subset (at least one caller) the members of which may be verified and confirmed.

Either during the data accumulation phase, or after the processing phase to isolate a subset, a distinct operation may involve actuating the interface terminal **T1** for direct local communication between the caller and an operator at the terminal **T1**. Another distinct operation may involve actuation of the printer **PR** to provide documents in relation to the operating format, as for providing award certificates as for verifying members of an isolated subset. Also, charge slips may be generated containing at least part of the data of a particular transaction.

An appreciation of the philosophical operation of a system in accordance with the present invention may now be enhanced by considering an exemplary operation of the illustrative embodiment of FIG. 1 to isolate a subset of people who are susceptible to a particular disease or infirmity. The exemplary operation might involve a geographical area, as a large city or population center, in which a particular health problem is somewhat acute. For example, a major population center might be polled where coronary artery disease is a significant problem. Accordingly, persons

6

most susceptible to such disease could be identified for corrective recommendations.

People of the population center could be informed of the availability of a service for statistical health analysis. Accordingly, persons interested in their individual statistical situation would be motivated to utilize the service. Specifically, individual callers would use the remote terminals **T1-Tn** to contact the central station **D** through the communication facility **C** and thereby provide personal information that would enable a statistical analysis in relation to existing data so as to isolate and inform (either real time or batch basis) those persons statistically most likely to be in need of corrective measures. In such applications, it may be important that the caller's identity be subject to reliable verification. Other applications or programs also may present a critical need for positively verifiable identification to the extent that credit card numbers and/or personal identification numbers may be employed.

An exemplary operation of the system, with regard to a specific caller, will now be treated referring somewhat concurrently to FIGS. 1, 2 and 3. As indicated above, FIG. 2 indicates a data storage format for a memory cell in an exemplary processor **PR** and now will be considered with regard to an operating format in which data is composed for a caller. Pursuing the above example, assume the existence of a caller at the remote terminal **T1** (telephone number (213) 627-2222) who wishes to pursue health-related information on the basis of statistical analysis. The caller lifts the hand piece **10** and in accordance with conventional techniques actuates the push buttons **14** to call for a select operating format, e.g. telephone number (213) 627-3333 and thereby establish communication through the facility **C** with a designated function unit in the central station **D**. Receiving the call signal, the automatic call distributor **AC1** associates the called number ((213) 627-3333, rendered available using standard telephone DNIS techniques) through the interface **20** and the switch **21** to attain connection with the specific processor, e.g. the processor **PR1** formatting the health-related program. Accordingly, the processor **PR1** cooperates with the interface **20** to cue the interface **20** to operate as a voice generator.

The sequence of operations is represented to be initiated in FIG. 3 by the "enter" block **40** which is accordingly followed by a "cue voice generator" command block **42**. If the ANI equipment is not employed, the voice generator in the interface **20** formulates speech, a representative form of which might be: "Thank you for participating in the coronary artery disease statistical analysis. Please give us your telephone number by actuating the call buttons on your telephone instrument."

Acting on the instructions, the caller would push the buttons **14** in sequence to indicate his telephone number, e.g. "(213) 627-2222". Alternatively, the interface **20** can accept the calling number ((213) 627-2222) according to its provision by standard ANI equipment of the communication facility **C**.

The resulting data signals are communicated from the interface unit **20** (FIG. 1) to the processor **PR1** for testing the telephone number as valid or entitled. Essentially, the format of a proper number prompts production of a valid or "good" signal. The test is indicated by the block **44** (FIG. 3). If the response is not valid or entitled, for example contains an inappropriate number of digits or has been used to a point of excess, the operation of block **46** is initiated again cuing the voice generator **30** (FIG. 1). The voice generator accordingly instructs the caller, e.g.: "You have not entered a

5,898,762

7

proper telephone number. Please reenter your telephone number by pressing the appropriate call buttons." The caller is then allotted a predetermined period of time to make a proper entry with the consequence that the system moves to a test operation as indicated by the block 48 (FIG. 3). Specifically, block 48 poses the query: "Is the second try good?"

If the caller is again unsuccessful, the system purges the record as indicated by the block 50 and the call is terminated as indicated by the block 52. In an alternative mode, the processor PR1 may abort the interface and couple the interface terminal IT for direct personal communication with the caller. The interchange would then proceed, person-to-person.

If the caller responds with a proper telephone number, the operation proceeds. Specifically, the system sequences to record the response of the proper telephone number as indicated by the block 45. That is, the caller's telephone number is recorded in an assigned specific memory cell identified with the caller. The format of the cell C1 is indicated in FIG. 2. The first portion, section 53, contains a form of identification data, i.e., the caller's telephone number, i.e. "(213) 627-2222".

Note that as explained above, if the second attempt to formulate a proper number is successful, as manifest by the block 48 (FIG. 3), the response is recorded at that stage. In either case, exiting from the block 54 (FIG. 3) invokes the next operation of again queuing the voice generator as indicated by the block 56.

As an alternative format, if a selective-group polling operation is performed, or callers are otherwise to be cleared for entitlement as mentioned above, a caller may be qualified by providing a "one-time" key number. The processor PR1 may incorporate a look-up table for proper key numbers which numbers may be coded using any of a wide variety of techniques. As a simple illustrative example, the key may comprise a precise number of digits that always total a particular numerical value.

The system proceeds after the caller is qualified. Specifically, the cue to the voice generator of the interface 20 (FIG. 1) as represented by the block 56 produces a request for further information from the caller with further identification data and answer data. For example, the voice generator might request information by stating: "Please use the telephone buttons to indicate initials of your name."

The detailed operation is not represented in FIG. 3 as it is similar to the operation illustrated by the blocks 42 through 54. However, again, a proper response is registered in the storage cell C1 as illustrated in FIG. 2 by the number "53" also registered in the first section 53 of the cell.

The cycle of obtaining digital information from the caller next is repeated with respect to answer data, i.e. specific health data. For example, as illustrated in FIG. 2, the next section 58 in the cell C1 receives an accumulation of health data, including the caller's age, weight, . . . , pulse rate, and so on. Representative digital numbers are illustrated in FIG. 2.

During the course of the telephonic communication, the processor PR1 formulates identification data for the caller specifically including: the chronological sequence of the call, the assigned designation of the call, and a set of acknowledgment digits for the call. Such data identification is registered in the caller's assigned cell C1 in accordance with the format of FIG. 2 being stored in sections 62, 64 and 66. Note that the data may be stored in a coded interrelationship. For example, the acknowledgment digits may be

8

related to the call record sequence. In the illustrative example, the chronological order number of the caller is 4951. The acknowledge digits may be derived from the sequence number. For example, as illustrated, a coded relationship may be established by adding "two" to each of the individual record sequence digits. Considering the example numerically:

	4951
	<u>2222</u>
Adding without propagated carries:	6173

Note that the confirmation data as acknowledgement digits can be extremely important, as to communicate with an isolated member of a subset. For example, identification could be published or circulated, as by a television broadcast, then respondents checked by use of confirmation data that may be confidential.

Continuing with the above example, the call chronological sequence registered for the caller is 4951 as represented in the section 62 while the acknowledge digits are 6173 as registered in the section 66. Additionally, the processor PR1 develops an assigned designation number, e.g. designation "4951684", which is registered in the section 64, the acknowledge code or digits, e.g. 6173, being registered in the section 66. These values are formulated in accordance with conventional number techniques during the data acquisition phase. With the exemplary numerals formulated, the operation proceeds.

The processor PR1 (FIG. 1) cues the internal memory. That operation is indicated by the block 68 (FIG. 3). Thus, the processor PR1 fetches the call record sequence number, assigns a designation (if not previously assigned), and encodes the sequence number as the acknowledgment digits (if not previously accomplished). These operations are indicated by the block 70 (FIG. 3).

Next, the processor PR1 (FIG. 1) cues the voice generator in the interface 20, as indicated by the block 72 (FIG. 3) to provide information to the caller. Specifically, for example, the voice generator in the interface 20 (FIG. 1) might signal: "This transaction has been designated by the number 4951684, and is further identified by the acknowledgment digits 6173. Please make a record of these numbers as they will be repeated. Specifically, the designation number is 4951684. The acknowledgment digits are 6173. Please acknowledge this transaction by pressing your telephone buttons to indicate the acknowledge digits 6173." In various applications as those involving security, the order and acknowledgment of callers may be very important. Therefore, data for confirmation associated with the order is important.

The system next proceeds to the test mode as indicated by the block 76 (FIG. 3). If the caller provides the correct acknowledgment digits, the data is confirmed in the record as indicated by the block 80 and is registered in the cell C1 (FIG. 2). Additionally, the voice generator is sequenced as indicated by the block 82 (FIG. 3) to indicate the close of the communication and that the transaction is terminated as represented by the exit block 84.

In the event that a caller cannot confirm his acknowledgment digits, as indicated by the block 76, a repeat operation is performed as indicated respectively by the blocks 86 and 88. Specifically, the voice generator is queued for a second instructional message. In the event that the second attempt also fails, the data is purged and the call discounted as

5,898,762

9

indicated by block **90** and an exit block **92**. If the second try is successful (test block **88**), as indicated by the block **80**, the record is perfected as indicated above.

As a result of the likelihood of a large number of calls, as described above, data cells in the processors **PR1-PRn** (FIG. **1**) are developed with specific information indicative of a statistical sampling of the populace of concern. The data of that statistical sampling may be self-generating of specific conclusions with respect to a subset of individuals, and/or supplemental data to clearly manifest a significant subset. For example, the data may indicate a significant departure from an assumed normal characteristic. Such data, accumulated from the polling may be considered by logic comparisons in the computer **22** to select the subset of persons who should be isolated.

In addition to the self-generating conclusions available from the received data, the system may involve the introduction of external data. In the physical fitness example, such external data might take the form of national statistical data. In any event, the processing operation usually involves comparison testing which compares caller data from individual memory cells of the processors **P1-Pn** (FIG. **1**) with test data that is supplied through the command terminal **CT**.

In the above example, members of the public in general were invited to use the service. A number of alternatives exist which might well impact on the statistical analysis. For example, a list may be preserved by a use-rate calculator to implement a consumable key operation. That is, a user is qualified to a specific limited number of uses during a defined interval.

As another example, callers might be restricted to the purchasers of a specific product as a medical apparatus for measuring blood pressures, heart rates, or so on. In such situations, it will be apparent that the statistical data will be somewhat distorted from an average or normal sampling. Clearly, the processors **P1-Pn** can be programmed to take into account such considerations. In that regard, the processors might also verify identification data proffered by a caller. Such data might take the form of a credit card number or a personal identification number. Methods for verification of such numbers using computer techniques are discussed below.

As indicated above and detailed below, the system can be programmed or formatted for use in a variety of applications. Preliminary to considering exemplary forms of such applications, reference will now be made to FIG. **4** showing an exemplary structural form for the processors **PR1-PRn**. From the switch **21** (FIG. **1**) a pair of communication lines **90** and **91** are indicated in FIG. **4** (top left). The line **90** provides signals from a processing unit **92** while the line **91** provides signals to the processing unit **92** along with other components as represented in FIG. **4**. The separate lines **90** and **92** facilitate explanation.

The processing unit **92** may take the form of a mini-computer programmed to accommodate the functions of various applications, as disclosed in detail below. As indicated above, the system may utilize a plurality of independent function units or processing units, e.g., processing unit **92**, operating in a somewhat parallel configuration, or alternatively, a limited number of processors may be driven sequentially to accommodate the functional operations as described.

The input line **91** (upper left) is connected specifically to a qualification unit **93**, a sequencer **94** and a designation unit **96**, as well as the processing unit **92** as indicated above. The qualification unit qualifies access from a remote terminal

10

T1-Tn to the processing unit **92** as described in detail below. In accordance with various applications or operating formats, the qualification unit **93**, the sequencer **94** and the designation unit **96** operate preliminarily with respect to individual callers. Generally, these units qualify or test callers for entitlement, develop a sequence-of-calls record and provide forms of designations for callers that may be authenticated. As described in detail below, the units function in sequence to accomplish such operations and accordingly are each individually connected to the processing unit **92** and a buffer storage **97**. Essentially, the buffer storage **97** is illustrated separately from the processing unit **92** along with the unit **93**, sequencer **94**, unit **96**, and so on, again in order to facilitate the explanation. Similarly illustrated are a memory **98** (with cells **C1-Cn**), a look-up table **103** and a clock **105**.

Considering the processor of FIG. **4** in further detail, the qualification unit **93** (upper left) is connected to a look-up table **99** and a use-rate calculator **100**. The designation unit **96** (top center) is connected to a random number generator **101** and an encryptor **102**.

In view of the above structural description of the system, consideration will now be given to certain specific applications in relation to the operation of the system. In that regard, the operation of the system will next be considered to automate a mail-order facility.

Assume that a caller at a terminal **T1** (FIG. **1**) dials a specific number to identify a mail order interface with the system of FIG. **1**. For example, assume the telephone number "(213) 627-4444" for such an interface. Accordingly the caller dials the number at the remote terminal **T1**. As a result, the communication facility **C** couples the terminal **T1** through the automatic call distributor **AC1**, the interface **20** and the switch **21** to a select processor **PR1** identified and programmed for a mail-order operating format. Note that the communication facility **C** provides the dialed number ("(213) 627-4444") to the processing system **P1** through well known telephonic equipment **DNIS**. Accordingly, a program is selected to execute the mail order interface.

As a preliminary action, a voice responder in the interface **20** might be cued by the processing unit to identify the mail-order house and indicate that the order will be taken by computer. Either before or after qualification, the caller might be advised that if he prefers to communicate directly with a person, or needs such contact at any point in the communication, he may accomplish it simply by pushing the asterisk button (*) at the terminal **T1**. Such action forms an abort signal that is detected by the processing unit **92** to transfer the communication to the interface terminal **IT** (FIG. **1**). Alternatively, the customer may be asked (by voice cue) to provide detailed information as name, address, etc. which is recorded for later processing.

After the preliminary information is supplied to a caller, the qualification phase is initiated. For example, the interface **20** might actuate the terminal **T1** to announce: "Please indicate the type of credit card you will use for your purchase by pushing the button number 'one' for Mastercharge, 'two' for . . .

The caller's response, indicating a specific credit card, will be stored in a data cell; however, the data is developed initially in the buffer **97**. The format and data for the present example (in the buffer **97**) will be explained with reference to a storage block format **104** as illustrated in FIG. **5**. The first data block **130** accordingly registers a digit to indicate the card that will be used to support the caller's purchase.

Using voice prompt, the interface **20** next instructs the caller to use the telephone buttons to indicate his credit card

5,898,762

11

number and the expiration date of the card. That data is stored in the register **104**, specifically in the blocks **132** and **134** as illustrated in FIG. 5.

Next, the caller is asked for his customer number, as it may appear on his catalog. That number is stored in a block **136** of the block format register **104**. Note that the caller may not be identified in the files of the mail-order house and in that event, the operation may be shifted to a manual operation to be continued through the interface terminal IT (FIG. 1) as explained above. For a television-initiated mail-order transaction, other numerical codes might be employed as to key into broadcast schedules. For example, a code might be used to indicate program times and thereby enable evaluation of the productivity of such program times. Such operation may be performed during the designation phase as described below.

To continue with the explanation of the automated format, assume that the customer has a file customer number and that it is stored in the block format register **104** along with his credit card number and expiration date. From that location, the data is checked by the qualification unit **93** (FIG. 4) for propriety as part of the test or qualification phase of operation. The check or test is in two stages and both are performed during an interval designated **t1**, the qualification unit **93** operating under control of the processing unit **92**.

First, the data is verified as representing valid and proper data formats for the customer's number, the credit card number and expiration date. The second operation involves consulting a so-called negative list to assure that the identified card and customer's number have not been cancelled, as for example in the case of credit cards that have been lost or stolen. Detailed structure for such tests is described in the parent case from which this case continues and may be incorporated in the qualification unit **93**.

With the successful completion and verification of the preliminary data in the block format register **104**, the qualification phase of operation is concluded and the system next interfaces with the caller to acquire and process data for a specific order of merchandise. Note that in the mail-order operating format, the sequence of the call is not normally significant. However, the sequencer **94** may log the time during a period **t2** if deemed worthwhile.

Somewhat as described above in relation to the initial operating format (health poll), the voice generator in the interface **20** prompts the caller through a series of exchanges that load the storage block format register **104** with a merchandise order. Thus, as purchase items are confirmed, the register **104** is loaded as exemplified by the blocks **140** and **142**. The interchange continues until the customer indicates he does not wish to order any additional items. The system then operates the designation unit **96** (FIG. 4) during the interval **t3** to develop and announce the acknowledgement digits as stored in the block **144** (FIG. 5). The acknowledgement digits serve to identify the order both for the caller and the mail-order house. Accordingly, tracing is facilitated. The data (FIG. 5) is then transferred from the buffer **97** (FIG. 4) to a select memory cell **C1-Cn**.

During the next interval **t4**, the processing unit **92** (FIG. 4) isolates data of the cells **C1-Cn** to facilitate the mail-order process. In that regard, the processor **92** may incorporate structure and processing techniques as disclosed in the parent case.

Of the wide variety of other operating formats and applications in accordance herewith, further examples will now be described with reference to the systems of FIGS. 1 and 4. However, from a consideration of the operating formats

12

treated below, it will be apparent that certain structural elements have reoccurring significance in the combination. Specifically, such elements include the structures: (1) utilizing the called number to select a specific operating format, (2) for screening or selecting callers who will be accepted based on various criteria, (3) for designating callers in a manner to enable subsequent positive identification and (4) various processing aspects of the data manipulations including the provision of at least a portion of certain ID data provided directly from the telephone apparatus. With respect to the data processing, distinctive elemental features include the utilization of external data not available during the interval of gathering data, the utilization of an interrelationship between the composite data collected during a data acquisition period, and the operation of utilizing time or sequence of callers to accomplish a subset.

As the next illustrative operating format, an instant lottery system will be described. Accordingly, assume the existence of a legalized state lottery accommodated by the telephone system utilizing a pay-to-dial number ("(213) 976-xxxx") and restricted to a limited number of uses for defined intervals of time. For example, a person might be entitled to play the lottery a limited number of times or to the extent of a limited dollar value during a predetermined interval.

From the terminal **T1** (FIG. 1) the caller would actuate the push buttons **14** to establish contact with the processing system **P1** coupling would be through the communication facility **C**, the automatic call distributor **AC1**, the interface **20** and the switch **21** as described in detail above. The initial operation then involves qualification of the caller to participate in the instant winner lottery. Again, ANI or caller interface techniques may be employed. If the caller is involved, the interface **20** is actuated by the qualification unit **93** during the operating interval **t1** to instruct the caller: "Please key in your telephone calling number". As indicated above, an alternative involves the system simply registering the calling number on the basis of its provision by ANI equipment.

In any event, after the caller's telephone number is registered, the instruction is given: "Participation in instant winner lottery is for persons over twenty-one years of age. Accordingly, please key in the year of your birth". A driver's license or credit card number may be similarly registered to confirm age. Alternatively, the combination of telephone number and date of birth could be used. In any event, the caller's data is registered and the qualification unit **93** then functions to test the data as provided. Specifically, the caller's telephone number is checked in a look-up table **99** to determine whether or not it is a proper and currently valid number for use in the lottery. Concurrently, the number is checked by the use-rate calculator to determine the number of times it has been used in excess of a predetermined number of calls or dollar value to participate in the lottery during a current interval of monitoring.

If the data indicates a qualified caller, the system proceeds to the next phase of designating the transaction. Note that the sequence is not significant in this operating format with the consequence that the interval **t2** and the operation of the sequencer **94** may be bypassed. Rather, the designation unit **96** operates during the interval **t3** to provide the caller with a designation for the current transaction and if applicable, updates the file as to current use or dollar value remaining for the caller's use. As explained above, the random generator **101** with or without the encryptor **102** may be employed to create an identification number which may include an encrypted form of the caller's telephone number. Accordingly, data for the transaction is established in the

5,898,762

13

buffer 97 then set in a cell of the memory 98 (FIG. 4). Specifically, the completed data cell format might be as follows: Telephone No.—Birth Year—Designation—Random No.

The system next functions to generate the random number as indicated above which will then be tested against a series of other numbers to determine whether or not the caller is a winner. In that regard, elements in the processing unit 92 which accomplish the operation are illustrated in FIG. 6 which will now be considered in detail.

A random number generator 160 functions on command to provide a three-digit number. With the consummation of a call, the random number generator 160 is actuated to provide the caller's random number in a selected caller cell 162. From that location, the caller's random number is compared with numbers from a register 164 by a comparator 166. The numbers in the register 164 were previously passed through a gate 174 from the generator 160. In the event of coincidence, the comparator provides an output "yes" signal to a line 168. Conversely, the failure of coincidence prompts the comparator 166 to provide a "no" output to a line 170. Essentially, a "yes" indicates a win while a "no" indicates the caller has lost.

The elements of FIG. 6 provide a random operating format to determine winners on a somewhat statistical basis; however, the system increases the probability with the passage of time when no win occurs. In that regard, at the outset of an operating cycle, the random number generator 160 provides a random number that is passed through the gate 174 to the register 164. In the exemplary format, a three-digit number would be provided. At that stage, the caller's random number, from the cell 162, would be compared with the single number in the register 164 by the comparator 166. However, with the passage of time, calls are tallied or time is metered by a counter 178. Accordingly, upon the attainment of a predetermined count, the gate 174 is again qualified to enter another number in the register 164. Accordingly, an increasing set of numbers are held in the register 164 for comparison with each caller's number. Of course, the more numbers in the register 164, the higher probability of a caller winning and that relationship depends upon the duration or number of calls since the last winner.

Either a win or a loss as indicated within the processing unit 92 (FIG. 4) prompts the interface to respond appropriately to the caller announcing his results. If there is a win, the designation may be reinforced and additional identification may be taken as explained above. Of course, if the prize simply involves a credit on the caller's telephone bill or his credit account, identification and designation become less critical considerations.

In the event of substantial awards to be claimed, the processing system P1 (FIG. 1) may actuate the printer PR to produce a positive identification of the winner, which document may be redeemed only by the caller providing the assigned designation along with confirmation of his identification data.

Generally in relation to awards, the processing unit 92 may also utilize a random number format for determining the significance of awards. That is, a random number may be actuated to provide numerals from one through twenty, for example, the magnitude of the number generated for a caller indicating the significance of his award. Normally such information would be provided to the caller and registered in his memory cell.

With respect to memory cells generally, it is to be noted that actuated memory cells may be cleared for callers who

14

are not winners. Accordingly, a limited number of memory cells store the subset of winners for subsequent confirmation processing and so on.

As another operating process format in accordance with the present invention, consider an auction sale. As disclosed herein, the auction format is associated with television as, for example, in the form of a cable channel for dedicated use during an interval of an auction sale.

Preliminarily, in accordance with the disclosed exemplary format, persons wishing to participate in the auction sale would make preliminary arrangements involving utilization of the system to establish authorization data for qualified bidders in cells C1–Cn of the memory 98 (FIG. 4). In an alternative format, the bidders could simply be qualified immediately before bidding, as on the basis of a charge-card number or other identification.

Generally, it is contemplated that callers are coupled into the system only during the bidding on specific items of merchandise. Accordingly, some prequalification may be desirable to facilitate the rapid accumulation of a bidding group with the introduction of a unit of merchandise.

In accordance with the disclosed format, an auctioneer conducts the sale in a somewhat traditional manner, recognizing that he is interfacing a relatively large audience through the system of the present invention and with a television connection. Specifically, the auctioneer is cued as to audience reaction by a monitor incorporated in the command computer terminal CT (FIG. 1). Essentially, the auctioneer is given an abstract or summary of the relative bidding as the auction progresses. In one format, the caller sees the auction on a television receiver. That is, the monitor may be covered by a television camera to inform the audience and particularly interested bidders. Consider the detailed steps of the operation.

As the auctioneer announces the next item for sale, it is televised to potentially interested bidders. In addition to being informed of the merchandise, potential bidders might also be reminded of the telephone number for participating in the auction. Accordingly, any interested person at a remote terminal T1–Tn may dial the auction number and obtain access to the processing systems P1–Pn. The caller would have a television set available, tuned for example to a cable channel.

Any preliminary qualification as indicated above will then be performed along with any appropriate designation. With regard to the designation, unless callers are identified as part of the qualification step, the designation unit 96 (FIG. 4) assigns a limited-digit number to individual callers for use by the auctioneer interfacing the command computer and terminal CT. Further designation and sequencing as disclosed herein also constitute part of the process. To the extent that qualification and designation operations may be performed, the operations are performed as described above with reference to FIG. 4 by the qualification unit 93 and the designation unit 96. Of course, any of the safeguards and limitations as described herein may be employed as deemed appropriate for an auction format.

After the preliminaries, the auctioneer initiates the bidding with respect to a particular item that is observed by the callers on a television receiver as through a cable channel. Note that the audio may be variously coordinated through the telephone communication facility C and the audio channel of the caller's television. In a simple format, after an introductory phase, communication to callers with respect to the bidding is provided through the television link. Alternatively, the audio unit AD (FIG. 1) may be employed.

5,898,762

15

Essentially, the auctioneer initiates the bidding by stating an initial value for the opening bid. Callers are invited to bid by actuating the push buttons 14 (FIG. 1). For example, the auctioneer may invite an initial bid of one hundred dollars asking callers to so bid by entering an asterisk (*) by punching the button so designated. In accordance with one operating format, cells in the memory 98 (FIG. 4) are actuated to register the bidding number in identified relationship with several calls. Note that although a record may be desirable, it is not usually necessary to record all bids, particularly at initial bidding figures. In any event, the individual processing units, e.g. unit 92 in individual processors PR1-PRn are interconnected (FIG. 1) and operate to select the final and key bids.

After attaining the initial bid, the auctioneer may invite further bidding by seeking a bid of two hundred dollars or any bid. Such a bid might be accomplished either by punching the asterisk button to attain the solicited bid, or by using number buttons to enter a different bid, e.g. two hundred fifty by buttons "2", "5" and "0". Again, cells of the memory 98 are actuated to record select bids (sequence) at the higher value.

The status of the bidding is presented to the auctioneer by the monitor of the command computer terminal CT (FIG. 1). Specifically, the auctioneer is provided an indication of the number of bidders at each level. If a sizeable number of callers bid at a specific value, the auctioneer may wish to advance the price significantly for the next round of bidding. Thus, the auctioneer proceeds until a small group of remaining callers are addressed. Note that the display of the command terminal CT (FIG. 1) may also inform the auctioneer of fresh bidders.

As the selection process proceeds, signals from the clock CL (FIG. 1) are introduced to indicate the sequence of bidders. For example, assume the bidding has proceeded to a stage where only three bidders remain active. The auctioneer is informed by the command terminal CT of the order in which the callers made their bids. The sequence is also of record in the cells of the memory 78 (FIG. 4) to indicate the sequence in the event that the final bid involves more than one caller. Of course, the first caller to respond with a bid would have priority in the purchase.

Normally at the conclusion of the bidding on a particular item, the contents of the cells in the memory 98 would be purged with only the final bidders being held in general memory within the processing unit 92. Of course, it is important to maintain a record of back-up bidders in the event the sale is not consummated with respect to the first of the highest bidders. That is, a subset of the highest bidders is preserved for each item of merchandise in the event that the highest bidder fails to qualify or the sale otherwise cannot be consummated. Of course, a distinct advantage of the system is the ability to accommodate a vast auction participation group for items of substantial value and as a consequence the distillation of a subset of callers is exceedingly valuable information.

To consider another operating format in association with the television media, a system will now be described whereby television viewers participate on a real-time basis in a game show for prizes. The ability to involve television viewers in a program has the potential of expanding program interest along with the expanded participation.

Game shows in accordance herewith may take any of a wide variety of forms as several well known programs in which studio contestants compete for prizes. In utilizing the system of the present invention to involve remote

16

participants, it may be desirable to preliminarily qualify and designate callers as explained above. Specifically, prior to participating in an actual game show, interested participants interface the system as depicted in FIG. 1, and in the course of an exchange as described above, the qualification unit 93 and the designation unit 96 cooperate with the processing unit 92 to accomplish preliminary data on potential participants in cells of the memory 96.

Various games will involve different screening processes and clearances. For example, a child's television game format may require parental clearance and in that regard written communication may be required for approvals. Such approval may require the assignment of a personal identification number to the child player as qualifying identification data.

As explained above, clearances may be perfected through the look-up table 99 (FIG. 4) in association with the qualification unit 93 or approvals through a consumable key step may be extended to incorporate functions of the processing unit 92 in association with the memory 98. For example, if qualification simply involves a check-off operation, the look-up table 99 will normally be employed. However, in the case of preregistration for a participant, as in the case of the auction sale, the memory 98 is involved with the qualification unit 93 through the processing unit 92 to establish a data cell C1-Cn for each qualified participant. Thus, each potential participant to be qualified interfaces with the processing unit 92 during a preliminary interval of operation to provide data in one of the cells C1-CN to facilitate qualification for participation during a real-time game show.

At the time of the show, callers are qualified simply by reference to their assigned memory cell data for a verification. Thereafter, the caller's exchange information to supplement their data as with respect to the play which follows. Specifically for example, a caller might select a studio audience participant with whom the caller is to be allied. The interface operation may be essentially as described above wherein a voice generator in the interface 20 (FIG. 1) provides signals which activate the remote telephone unit to speak the instruction: "If you wish to play with Player No. 1, please push button No. 1; if you wish to play with Player No. 2, please push button No. 2 . . . and so on". The caller may also be instructed to indicate the extent of a wager. For example, "Push the number button indicating the points you wish to risk".

The participant data is stored in an assigned cell of the memory 98 (FIG. 4) for the caller and as the game proceeds, the processing unit 92 tallies the caller's score. Scores are interrelated between individual processing units to actuate the terminal CT. Thus, individual accounting occurs for each of the calling participants on an on-line basis dependent upon the success of the studio players and their association with the callers. On-going accounting data may be provided at intervals or real time by the recorded voice to each contestant.

According to the described format, after an interval of play, the processing units, as the unit 92 (FIG. 4), operate to isolate a subset of caller-players who have amassed the highest scores. Of course, various arrangements may be provided for awarding prizes to the select subset of winning callers.

The above format involves a real-time game show with an on-line operating format. A somewhat similar format involves nonreal-time operation and in that sense, callers may interface with the system of the present invention

5,898,762

17

before and after the show; however, not primarily during the show. Such a show might involve a quiz for callers based on their ability to perceive and remember occurrences within the show. Preregistration may be employed, however, is not essential. Rather, callers may call after the broad-cast of a program. In that event, sequence or time clocking may be very important to limit or control individual interfaces to a specific time or geographic "window". That is, as suggested above, allocation-routing equipment and techniques may be employed in various of the formats to window callers. With the system, callers are screened or qualified at the time of a call, identified in a particular calling sequence, designated for identification and quiz answers are given for subsequent processing. Alternatively, players could participate by providing their credit card for billing or be billed through the "pay-to-dial" network. Consider an exemplary format.

A key to participation in the game show may involve the purchase of a particular product. For example, a person desiring to participate may purchase a product which carries a concealed key number. The number serves as a caller's key to participation in the game show.

In accordance with the disclosed operating format, after watching the broadcast of a television show (possibly a serial episode) the participant actuates the push buttons 14 at one of the remote terminals T1-Tn to accomplish an interface communication with the select operating format. For example, the caller may actuate the buttons 14 for the station number "277-7777" which identifies the game format of current description.

Assume responsive operation of the communication facility C to couple the caller through the automatic call distributor AC1 to the interface 20. Upon establishing a connection, the interface 20 receives the caller's telephone number through ANI equipment and a data cell in the memory 98 (FIG. 4) is assigned to the caller. Specifically, for example, associative coupling is provided for the caller through the switch 21 (FIG. 1) to the processor PR1 containing the memory 98 (FIG. 4) and a cell C2 assigned to the caller. A block format 200 is illustrated in FIG. 7 indicating the data that is developed in the cell C2. At the outset, the caller's telephone number is stored in a section 201 followed by uses/month in section 202.

Next, the caller is greeted and requested to give the key number entitling him to participate in the game show. The instruction constitutes an initial action to take place in an interval of qualification during the time t1. The caller actuates the buttons 14 providing digital representations to the qualification unit 93 (FIG. 4) and the look-up table 99 is consulted. Note that the table 99 may be a large, shared unit that tabulates each of the key numbers and accounts for their use. If the caller has identified a proper key number, the process proceeds and the key number is accounted, i.e. incremented or decremented to the limit of use if any. Alternatively, a repeat information operation may be requested as described in detail above.

As a further check during the qualification stage, the use-rate calculator 100 may function to determine whether or not an excessive number of calls have originated from the designated number. Thus, consideration involves calls or value with reference to a predetermined period of time. Again, a shared calculator may be used or addressing may obtain selectivity on the basis of calling numbers. If a large number of calls have originated from a single telephone terminal, a fraudulent situation may be suggested. Assuming no such indication occurs, the number of uses is registered in a section 200 (FIG. 7) and the operation proceeds from the interval t1 to interval t2.

18

During the interval t2, the sequencer 94 registers the precise time of the call in the buffer storage 97, specifically in a section 204 as illustrated in FIG. 7. With the entry of such data, the system passes from the operating interval t2 to t3.

The caller is next asked to identify himself in some specific manner. For example, the caller may simply be asked to provide the year of his birth. Alternatively, somewhat comprehensive information may be taken as in the form of drivers' license numbers, social security numbers and so on. Of course, such data may be employed for subsequent identification of the caller and, accordingly, is registered in the buffer storage 97 (FIG. 4). Specifically, identification information is registered in section 206 of the block 200 as shown in FIG. 7.

In addition to receiving identification information from a caller, the system assigns a designation to the caller. Specifically, the random number generator 101 (FIG. 4) provides a number which may be encrypted along with other identification data as the caller's personal identification to provide a numerical designation that is registered in the storage 97. Specifically, the designation is stored in a section 208 as illustrated in FIG. 7. With the designation operation complete, the interval t3 terminates initiating the data accumulation phase which occurs during an operating interval t4.

At this juncture, operating elements within the processing unit 92 will be considered in relation to an explanation of the manner in which select questions are provided to a caller and his answers received and recorded for subsequent processing to determine winners.

Preliminarily, reference will be made to FIG. 8 showing elements involved in the operating format which are contained in the processing unit 92 (FIG. 4) in association with the memory 98. To avoid confusion, the elements identified in FIG. 8 are designated by fresh numerals.

To accommodate the exemplary operating format, a dramatic program might be recorded preparatory to the television broadcast. A substantial number of questions would then be formulated based on the dramatic program. For example, "How many people were present when the will was read?"

It is contemplated that the dramatic program would be broadcast to different geographical segments of the country during different time intervals. To accommodate the different time intervals, it is proposed to utilize different questions for each geographic segment. That is, the basic format can remain the same, only the questions change by time zone to avoid study and collaboration on questions as a result of time shifts. A question propounded to a Chicago caller should not be repeated to a Los Angeles caller. In any event, callers might be given three questions randomly drawn from a pool serving one geographic segment and three questions drawn from a different pool serving another geographic segment.

The signals for prompting a voice generator are registered in memory sections MS1 through MSn. Each of the memory sections MS1-MSn is served by an address input AI1-AIn respectively. Similarly, the address inputs AI1-AIn are instructed by random number generators NG1-NGn, in turn actuated by decoders DE1-DEn. Consider the operating sequence of the memory MS1 as an example.

The decoder DE1 is responsive to telephone calling numbers (provided by ANI equipment) indicative of a particular geographic area. Note, for example, that area code numbers afford an effective geographic classification of callers which is very useful in many formats or processes of statistical analysis in accordance herewith. Note that geo-

5,898,762

19

graphic (or other) classification in accordance herewith is also accomplished by the called numbers provided. Each of several television stations would solicit calls for different numbers as a result, either by DNIS or call channeling. Select processors would be reached through the interface units, e.g. interface **20** FIG. 1. In operation, the decoder DE1 determines a call is from a specific geographic area and accordingly provides a signal to actuate the random number generator NG1. As a consequence, the random number generator NG1 provides a series of three random numbers in the form of addresses for the memory MS1. That is, the addresses may simply comprise three alphanumeric bits supplied to the address input AI1 to prompt the provision of three sets of voice generator signals for announcing the three questions in sequence. For example, the first question might be as suggested above: "Push the button on your telephone for the number of persons present in the room when the will was read".

The voice generator signals are supplied from the memory MS1 (within the processing unit **92**, FIG. 4) to the interface **20** (FIG. 1) which generates audio signals to actuate the caller's hand piece **10**. Accordingly, the caller is instructed to answer three questions, the responses being recorded in a section **210** of the data block **200** (FIG. 7). Note that the clock **105** (FIG. 4) may be utilized to limit the response period allowed each caller.

As indicated above, to accommodate broadcast of the program in a different time slot for a different geographic area, the decoder DEN (FIG. 8) actuates the random number generator NGn to address the memory MSn to provide three different questions as a result of a random selection. Accordingly, within a time or times (perhaps limited and offset) after the conclusion of the program, a substantial number of callers are accounted for in cells of the memory **98** and similar units of the composite system. The cells indicate sequences of calling and also may contain billing data where appropriate. That is, pay-to-dial operations avoid the need for billing, yet it may still be made of record.

Subsequent to the data accumulation phase of operation, the processing unit **92** (and its equivalents) is actuated during an off-line processing interval to isolate the subset of callers correctly responding to the questions. In accordance with one format, the subset of successful callers may be reduced to a sub-subset as by a random computer "draw" to define a group of significant winners. That is, a random number generator may be employed as explained above.

As an alternative to subsequent processing, the system may inform callers of their success during the course of the interface telephone call. That is, callers might simply be informed by cuing the voice generator: "Your answers are correct and in accordance with the program game, you will now be entered in the sweepstakes draw for the prize . . ." Thus, the format defines a subset then further selects a sub-subset of winners. In any of the various formats, the status of the analysis can be televised by selecting a camera focused on the interface terminal IT.

Still another operating format for the system takes the form of polling operations to determine opinion or facts. An illustrative form of the format is disclosed below again in association with a television broadcast.

Generally, the illustrative polling format is contemplated in association with a television broadcast addressing a matter of current interest as, for example, a political issue or election. A master of ceremonies propounds questions to a viewing audience, many of whom are on-line through an interface of a system of the present invention. The master of

20

ceremonies or commentator instructs the callers who are regulated and controlled by the system of the present invention to provide digital data which the system processes to inform the commentator as with regard to subsets of callers. For example, the commentator may be statistically informed as to the numbers of callers holding specific views. Consider a specific exemplary operating format.

Assume the existence of a system in accordance with the present invention installed for use in association with a television broadcasting facility. Of course, various previous arrangements could be involved; however, according to one arrangement a commentator simply invites members of the viewing audience to call a specific number and express their views with respect to a specific issue. Callers located at terminals T1-Tn (FIG. 1) activate the terminals to accomplish an interface with one of the processing systems P1-Pn as explained above. Note that the processor (or the interface **20** may involve operation of the qualification unit **93** (FIG. 4) to prevent callers from loading the poll. That is, to prevent multiple calls from a single terminal that would distort a poll, the qualification unit **93** registers calls in association with the use-rate calculator **100**. Interfacing a specific processor, callers are screened by the qualification unit **93** (FIG. 4). In such a poll, it may be important to control the sampling group on a statistical basis. For example, it may be desirable to limit callers from each of several geographic areas. Accordingly, by the use of ANI equipment, the caller's telephone number is provided to the qualification unit **93** during the preliminary interval ti, and a determination is performed with regard to the number of involved callers from the geographic area using the look-up table **99**. On attaining a full quota from a specific area, a subsequent caller may be informed that the lines are full. Alternatively, the caller may be requested to provide his telephone number for screening in the event ANI equipment is not available.

The caller may be requested to provide additional information so as to poll a balanced group. For example, a caller might be asked questions concerning age, political registration and so on by prompting the interface unit **20** to pose audio questions and testing the digital results through the qualification unit **93** as with reference to the look-up table **99**.

As indicated above, in the event that the broadcast television program is one of a series, it may be desirable to limit the extent of participation over a period of several programs. Accordingly, the use-rate calculator **100** (FIG. 4) may be employed in association with the qualification unit **93**. That is, if a calling number has participated in a prior poll, it may be denied access for a subsequent poll or its data not counted. Such operation would involve the use-rate calculator **100** in association with the qualification unit **93** performing logic tests to actuate the voice generator of the interface **20** for providing an appropriate interchange with a caller.

With the screening or qualification of a select group of callers, the sequencer **94** (FIG. 4) may or may not be involved to identify the order of callers. Also, the designation unit **96** may or may not be involved in view of the fact that for many polls there is little interest in subsequently identifying callers.

In the poll-format operation of the system, it is important to provide a capability of defining select intervals during which callers may provide data. In one arrangement, with the consummation of a communication interface between a caller and a processor unit, the audio of the television broadcast is keyed from the audio unit AD through the switch **21** (FIG. 1) for communication to the caller.

5,898,762

21

With a multiplicity of callers in interface relationship with the processors PR1-PRn as function units, a polling question is stated, for example: "If you favor expanded trade with . . . at the tone press button one; if you do not, press button two".

To control the interval of polling, the command computer terminal CT (FIG. 1) is actuated to enable the callers timely access to the processors.

At the expiration of a polling interval, the interfaces may be terminated or additional questions may be propounded. In any event, subsequent to the data-gathering phase, the bulk data is supplied to the command computer terminal CT incorporating computing facility to isolate subsets for communication by the broadcast. Accordingly, an effective on-line poll can be conducted with statistical sampling control and prompt display of responses.

As explained above, the arrangement of the function unit (or units) may be variously embodied in a single processor or many processors, depending on various considerations as time sharing, multiplexing, paralleling and so on. The systems as described above embody the components bulked together in one location. However, components of the system could be spaced apart geographically, using dedicated lines or polling techniques. An illustrative embodiment is shown in FIG. 9.

Call distributors CD1-CDn are at different geographic locations along with associated interface units IA1-IA n and IB1-IBn. Each of the interface units, as unit IA1 is coupled to a central processor 251 as indicated by lines 252, 254, 256 and 258. Each of the lines may take the form of a dedicated telephone line or a polling telephonic coupling.

In the operation of the system of FIG. 9, the call distributors CD are coupled to a telephonic communication system and accordingly allow the interface units I to provide interface communication between the central processing unit 251 and a multitude of remote terminals T1-Tn as illustrated in FIG. 1. With data accumulated in the cells, it may be variously down loaded as to a central processing station. Thus, the distributed-component system is capable of executing the various formats as explained above with reference to the illustrative structure.

In view of the above explanation of exemplary systems, it will be appreciated that other embodiments of the present invention may be employed in many applications to accumulate statistical data, process such data, and define subsets of callers of concern. While certain exemplary operations have been stated herein, and certain detailed structures have been disclosed, the appropriate scope hereof is deemed to be in accordance with the claims as set forth below.

What is claimed is:

1. An analysis control system for use with a communication facility including remote terminals for individual callers, wherein each of said remote terminals comprises voice communication means and digital input means in the form of an array of buttons for providing data, said analysis control system comprising:

an interface structure coupled to said communication facility to interface said remote terminals for voice and digital communication, and including means to provide caller data signals representative of data relating to said individual callers developed by said remote terminals; voice generator structure coupled through said interface structure for actuating said remote terminals as to provide vocal operating instructions to said individual callers;

record structure, including memory and control means, connected to receive said caller data signals from said

22

interface structure for accessing a file and storing digital caller data relating to said individual callers including said individual callers' credit card numbers provided from said digital input means through said interface structure;

credit verification structure to verify on-line said credit card numbers; and

qualification structure controlled by said record structure for testing said caller data signals provided by said individual callers to specify a consumable participation key for restricting the extent of access to said system by said individual callers to limit data stored for said individual callers on the basis of entitlement.

2. An analysis control system according to claim 1, wherein said qualification structure restricts said extent of access by each of said individual callers to a single use entitlement.

3. An analysis control system according to claim 1, wherein said consumable participation key includes a check digit wherein said check digit is tested by said qualification structure.

4. An analysis control system according to claim 1, wherein said communication facility further provides called terminal DNIS signals to identify a specific operating format from a plurality of operating formats.

5. An analysis control system according to claim 4, wherein said plurality of formats includes at least two formats which differ only in that in one format winners are selected during the course of the interface telephone call and in the other format winners are selected during an off-line interval after the telephone call.

6. An analysis control system according to claim 4, wherein said plurality of formats includes at least two merchandising formats which differ only in that one format includes testing by the qualification structure of a personal identification number (PIN) for restricting the extent of access to the system.

7. An analysis control system according to claim 4, wherein said plurality of formats includes at least two merchandising formats which differ only in that in one format caller data includes credit card data for billing and in the other format said system is accessed by a pay to dial network.

8. An analysis control system according to claim 4, wherein at least one of said formats receives caller data signals including personal identifying information.

9. An analysis control system according to claim 8, wherein said personal identifying data includes the callers age.

10. An analysis control system according to claim 8, wherein said personal identifying data includes the callers weight.

11. An analysis control system according to claim 8, wherein said personal identifying data includes the callers telephone number.

12. An analysis control system for use with a communication facility according to claim 1, wherein said specific individual caller digitally enters a type of credit card used.

13. An analysis control system for use with a communication facility according to claim 1, wherein said specific individual caller digitally enters an expiration date of said credit card.

14. An analysis control system for use with a communication facility according to claim 1, wherein said qualification structure includes check-off means for restricting said extent of access to at least a portion of said system by said respective one of said individual callers to a specific number of accesses.

5,898,762

23

15. An analysis control system for use with a communication facility according to claim 1 wherein said interface structure receives calling digital data automatically provided by said communication facility indicative of a caller's telephone number.

16. An analysis control system for use with a communication facility according to claim 15 wherein the calling digital data controls at least certain aspects of said interface based on at least a portion of said caller's telephone number.

17. An analysis control system for use in a mail order facility or the like, said analysis control system for use with a communication facility including remote terminals for individual callers, wherein each of said remote terminals comprises voice communication means and digital input means in the form of an array of buttons for providing data, comprising:

interface structure coupled to said communication facility to interface said remote terminals for voice and digital communication and including means to provide answer data signals provided by said individual callers from said remote terminals including signals indicative of an individual caller's customer number and credit card number;

credit verification structure to verify said individual caller's customer number and credit card number to determine said individual caller's credit;

record structure including memory and control means connected to said interface structure to receive and store data provided by said individual callers;

acknowledgement generator structure for providing a computer generated acknowledgement number to said individual callers;

switching structure for transferring certain of said individual callers to a live operator; and

central processing station coupled to said record structure to receive data on said individual callers.

18. An analysis control system according to claim 17, further comprising:

consumable key test structure for qualifying said individual callers with respect to said customer number, said customer number indicative of a consumable key number.

19. An analysis control system according to claim 18, wherein said consumable key number is limited to a one time use only.

20. An analysis control system according to claim 17, wherein an individual caller provides an expiration date for said credit card number.

21. An analysis control system according to claim 20, wherein said credit verification structure verifies said expiration date.

22. An analysis control system according to claim 17, further comprising:

a sequencer for developing sequence data signals as identification data to indicate the calling order sequence of said individual callers.

23. An analysis control system according to claim 17, wherein said credit verification structure verifies said individual caller's customer number and credit card number online.

24. An analysis control system according to claim 17, wherein said data stored in said record structure includes at least audio data indicative of a name or address for an individual caller for subsequent processing.

25. An analysis control system according to claim 17, wherein said answer data signals include signals indicative of merchandise order data.

24

26. An analysis control system according to claim 25, wherein said merchandise order data is indicative of an item number.

27. An analysis control system according to claim 26, wherein said merchandise order data is indicative of further data related to said item number.

28. An analysis control system according to claim 25, wherein said merchandise order data is indicative of color and size of an item.

29. An analysis control system according to claim 17, further comprising:

a call distributor for receiving a plurality of calls.

30. An analysis control system according to claim 17, wherein said communication facility automatically provides signals indicative of calling terminal digital data for at least certain of said individual callers.

31. An analysis control system according to claim 30, wherein said record structure stores said calling terminal digital data.

32. An analysis control system for use with a communication facility according to claim 30 wherein the calling digital data controls at least certain aspects of said interface based on at least a portion of said caller's telephone number.

33. An analysis control system according to claim 17, wherein said customer number provided by an individual caller is the same as the customer number indicated on said individual caller's mail order catalog.

34. An analysis control system according to claim 17, wherein said credit verification is performed on-line.

35. An analysis control system according to claim 17, wherein said communication facility further provides called terminal DNIS signals to identify a specific format from a plurality of formats.

36. An analysis control system according to claim 35, wherein said specific format is a television initiated mail order format.

37. An analysis control system according to claim 36, wherein said answer data signals include signals indicative of mail-order order data.

38. An analysis control system according to claim 37, wherein said mail-order order data is indicative of an item number.

39. An analysis control system according to claim 37, wherein said mail-order order data is indicative of further data related to said item number.

40. An analysis control system according to claim 37 wherein said mail-order order data is indicative of color and size of an item.

41. An analysis control system for use in a mail order facility or the like, said analysis control system for use with a communication facility including remote terminals for individual callers, wherein each of said remote terminals comprises voice communication means and digital input means in the form of an array of buttons for providing data, comprising:

interface structure coupled to said communication facility to interface said remote terminals for voice and digital communication and including means to provide answer data signals provided by said individual callers from said remote terminals including signals indicative of an individual caller's customer number;

credit verification structure to verify on-line said individual caller's customer number to determine said individual caller's credit;

record structure including memory and control means connected to said interface structure to receive and store data provided by said individual callers;

5,898,762

25

acknowledgement generator structure for providing a computer generated acknowledgement number to said individual callers;

switching structure for transferring certain of said individual callers to a live operator; and

central processing station coupled to said record structure to receive accumulated data on said individual callers.

42. An analysis control system according to claim 17, further including a plurality of interface structures, at least certain of said interface structures being located at geographic locations which are different from each other, and at least one interface structure is remote from the central processing station, wherein said data is downloaded from at least one of said interface structures to said central processing station.

43. An analysis control system according to claim 42, wherein said data is downloaded via telephonic communication.

44. An analysis control system according to claim 43, wherein said data is downloaded by telephone polling coupling.

45. An analysis control system according to claim 41, wherein said credit verification structure additionally verifies said individual caller's credit card number.

46. An analysis control system according to claim 45, wherein said credit verification structure verifies said individual caller's credit card number on-line.

47. An analysis control system according to claim 45, wherein said credit verification structure additionally verifies an expiration date for said individual caller's credit card.

48. An analysis control system according to claim 41, wherein said data provided by said individual callers includes audio data indicative of a name or address or both for said individual caller for subsequent processing.

49. An analysis control system according to claim 48, wherein said answer data signals include signals indicative of item data regarding items for order.

50. An analysis control system according to claim 49, wherein an individual caller further provides additional answer data signals with respect to said items.

51. An analysis control system according to claim 49, wherein at least certain of said answer data signals and said additional answer data signals are stored and processed.

52. An analysis control system according to claim 49 wherein said answer data signals include signals indicative of color and size of an item.

53. An analysis control system according to claim 41, wherein said computer generated acknowledgement number is indicative of a sequence number.

54. An analysis control system according to claim 41, further comprising:

qualification structure coupled to said record structure to qualify said individual callers based upon a limit on use.

55. An analysis control system according to claim 54, wherein said limit on use specifies a one time use.

26

56. An analysis control system according to claim 54, wherein said limit on use specifies a limited number of uses.

57. An analysis control system according to claim 54, wherein said limit on use is with respect to a dollar amount.

58. An analysis control system according to claim 41, wherein said communication facility further provides called terminal DNIS signals to identify a specific format from a plurality of formats.

59. An analysis control system according to claim 58, further comprising:

a call distributor to receive said called digital data (DNIS).

60. An analysis control system according to claim 59, wherein said call distributor receives calling digital data provided automatically by said communication facility indicative of said individual caller's telephone number.

61. An analysis control system for use with a communication facility according to claim 76 wherein the calling digital data controls at least certain aspects of said interface based on at least a portion of said caller's telephone number.

62. An analysis control system according to claim 58, wherein said specific format is a television initiated mail order format.

63. An analysis control system according to claim 62, wherein said answer data signals include signals indicative of mail-order order data.

64. An analysis control system according to claim 63, wherein said mail-order order data is indicative of an item number.

65. An analysis control system according to claim 63, wherein said mail-order order data is indicative of further data related to said item number.

66. An analysis control system according to claim 63 wherein said mail-order order data is indicative of color and size of an item.

67. An analysis control system according to claim 41, wherein said interface structure receives calling digital data provided automatically by said communication facility indicative of said individual caller's telephone number.

68. An analysis control system for use with a communication facility according to claim 53 wherein the calling digital data controls at least certain aspects of said interface based on at least a portion of said caller's telephone number.

69. An analysis control system according to claim 41, further including a plurality of interface structures, at least certain of said interface structures being located at different geographic locations from each other, and at least one interface structure is remote from the central processing station, wherein said accumulated data is downloaded from at least one of said interface structures to said central processing station.

70. An analysis control system according to claim 69, wherein said accumulated data is downloaded via telephonic communication.

* * * * *

EXHIBIT 10

United States Patent [19]
Katz

[11] **Patent Number:** **5,917,893**
[45] **Date of Patent:** ***Jun. 29, 1999**

[54] **MULTIPLE FORMAT TELEPHONIC
INTERFACE CONTROL SYSTEM**

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[*] Notice: This patent is subject to a terminal disclaimer.

[21] Appl. No.: **08/485,113**

[22] Filed: **Jun. 7, 1995**

Related U.S. Application Data

[63] Continuation of application No. 08/306,751, Sep. 14, 1994, which is a continuation of application No. 08/047,241, Apr. 13, 1993, Pat. No. 5,351,285, which is a continuation of application No. 07/509,691, Apr. 16, 1990, abandoned, which is a continuation-in-part of application No. 07/260,104, Oct. 20, 1988, Pat. No. 4,930,150, which is a continuation-in-part of application No. 07/018,244, Feb. 24, 1987, Pat. No. 4,792,968, which is a continuation-in-part of application No. 06/753,299, Jul. 10, 1985, abandoned, which is a continuation-in-part of application No. 07/640,337, Jan. 11, 1991, abandoned, which is a continuation of application No. 07/335,923, Apr. 10, 1989, which is a continuation of application No. 07/194,258, May 16, 1988, Pat. No. 4,845,739.

[51] **Int. Cl.**⁶ **H04M 11/00**
[52] **U.S. Cl.** **379/93.02; 379/93.12;**
379/93.13; 379/92.03
[58] **Field of Search** 379/92, 95, 97,
379/96, 94, 93, 91, 142, 88, 89, 91.01,
91.02, 92.01, 92.03, 93.02, 93.12, 93.13

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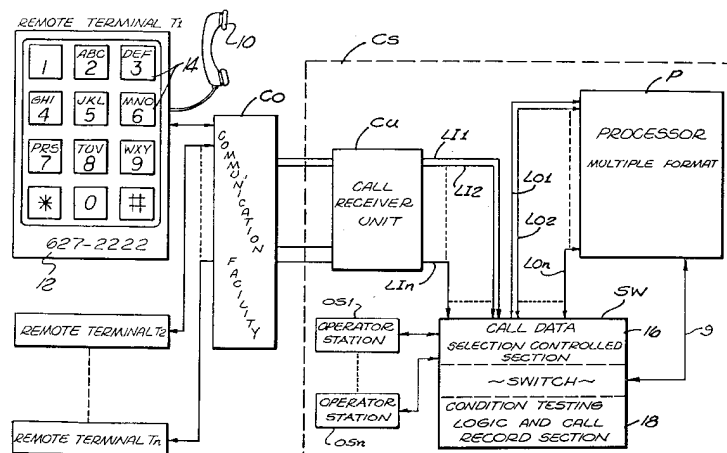
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[57] **ABSTRACT**

Call data signals actuated by a telephone terminal are provided from a telephone communication system to indicate call data as the called number, the calling number and the calling equipment. The call data signals address related control functions for selectively interfacing a live operator terminal or a multiple format multiple port data processing system. The interface connection involves providing a specific format as for automated processing or to prompt an operator. Screening tests and format selection are performed to make a determination. Individual telephone terminals and individual data formats are arranged and interfaced under controlled conditions specified by the call data. Time tests, history tests and demographic tests may be executed in addition to basic selection and qualification tests. Control may be executed from active data storage for assembled control words and record words. Record words for individual calls may be stored along with developed data.

89 Claims, 5 Drawing Sheets



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5,917,893

Page 11

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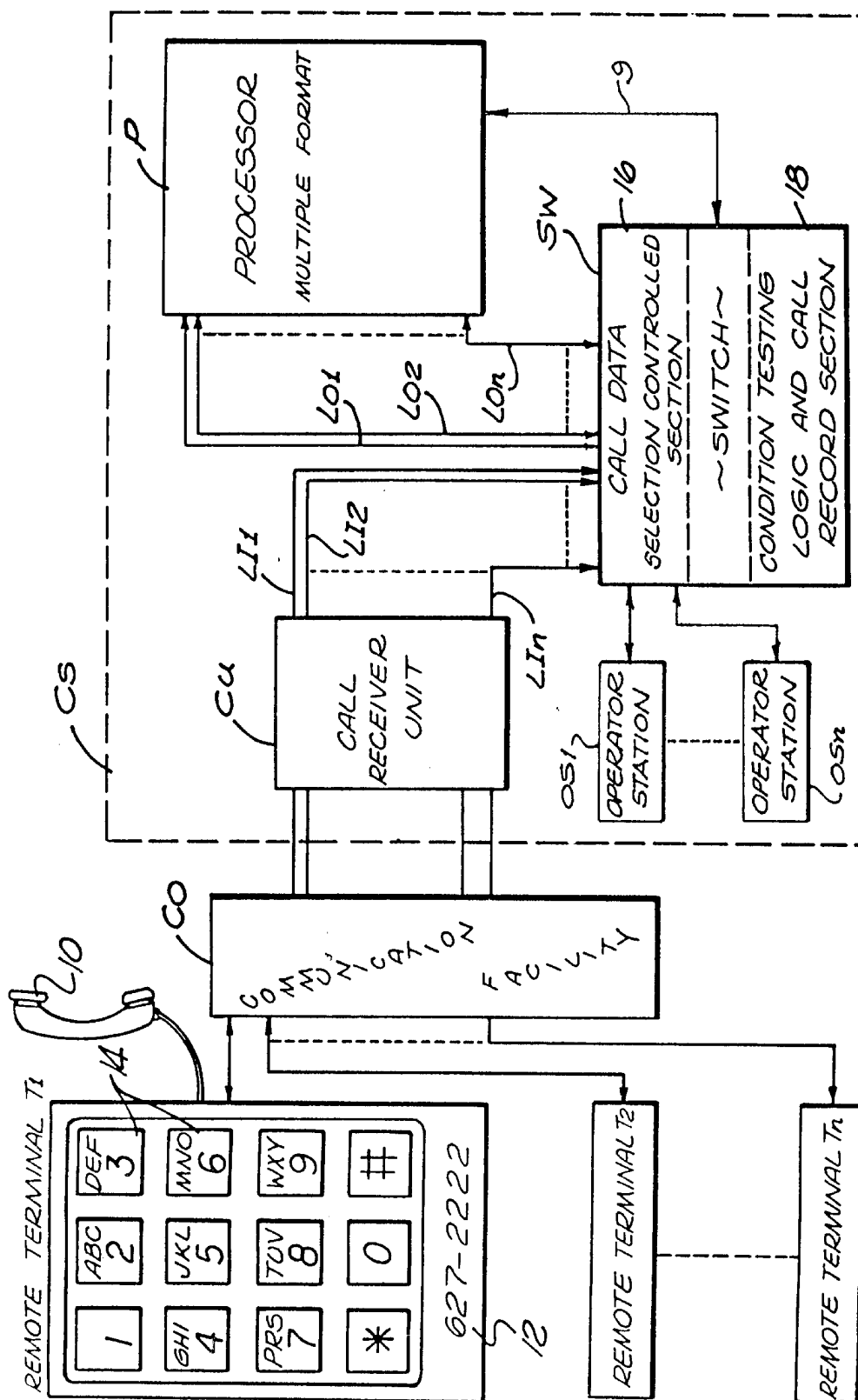
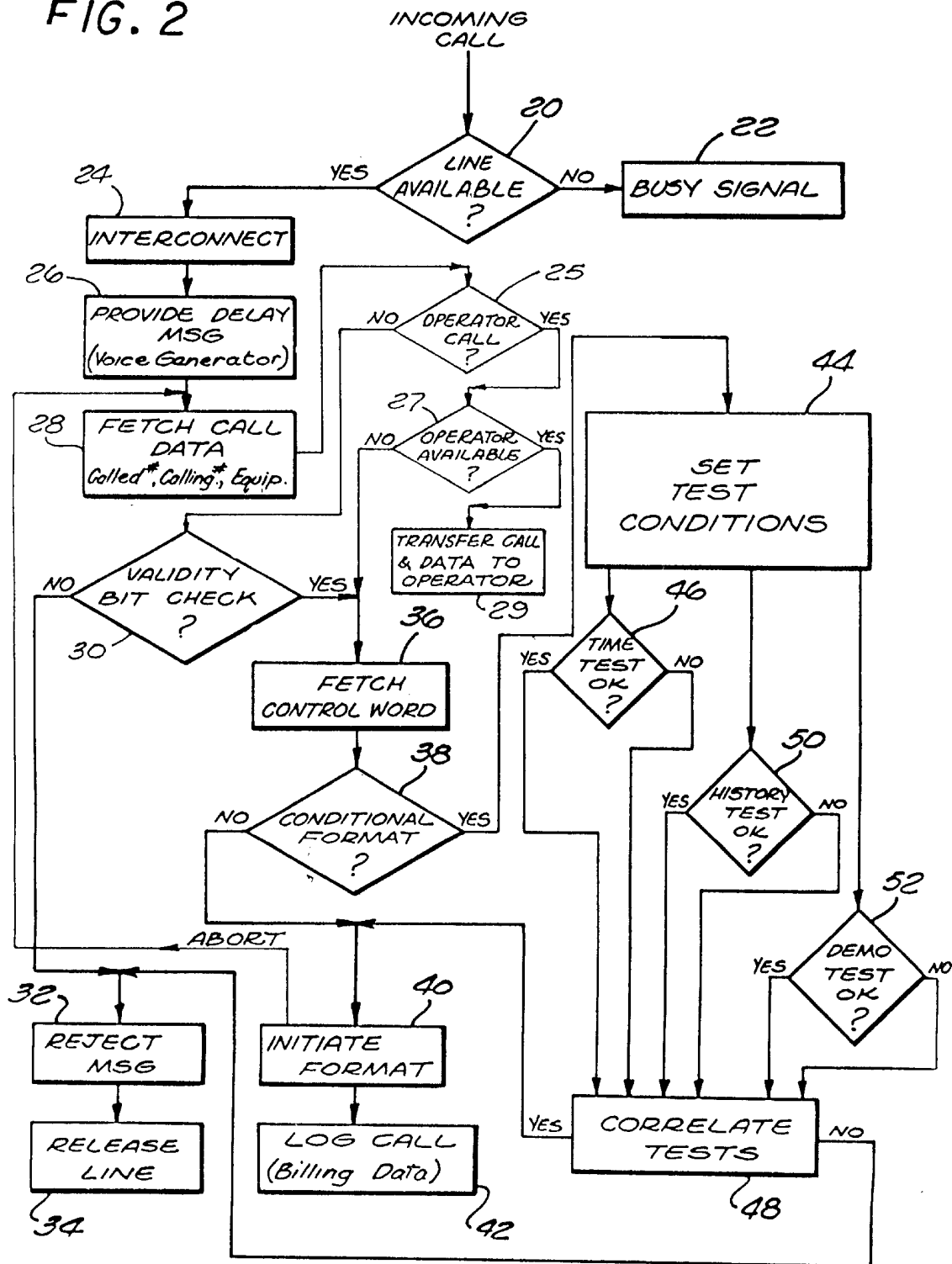


FIG. 1

FIG. 2



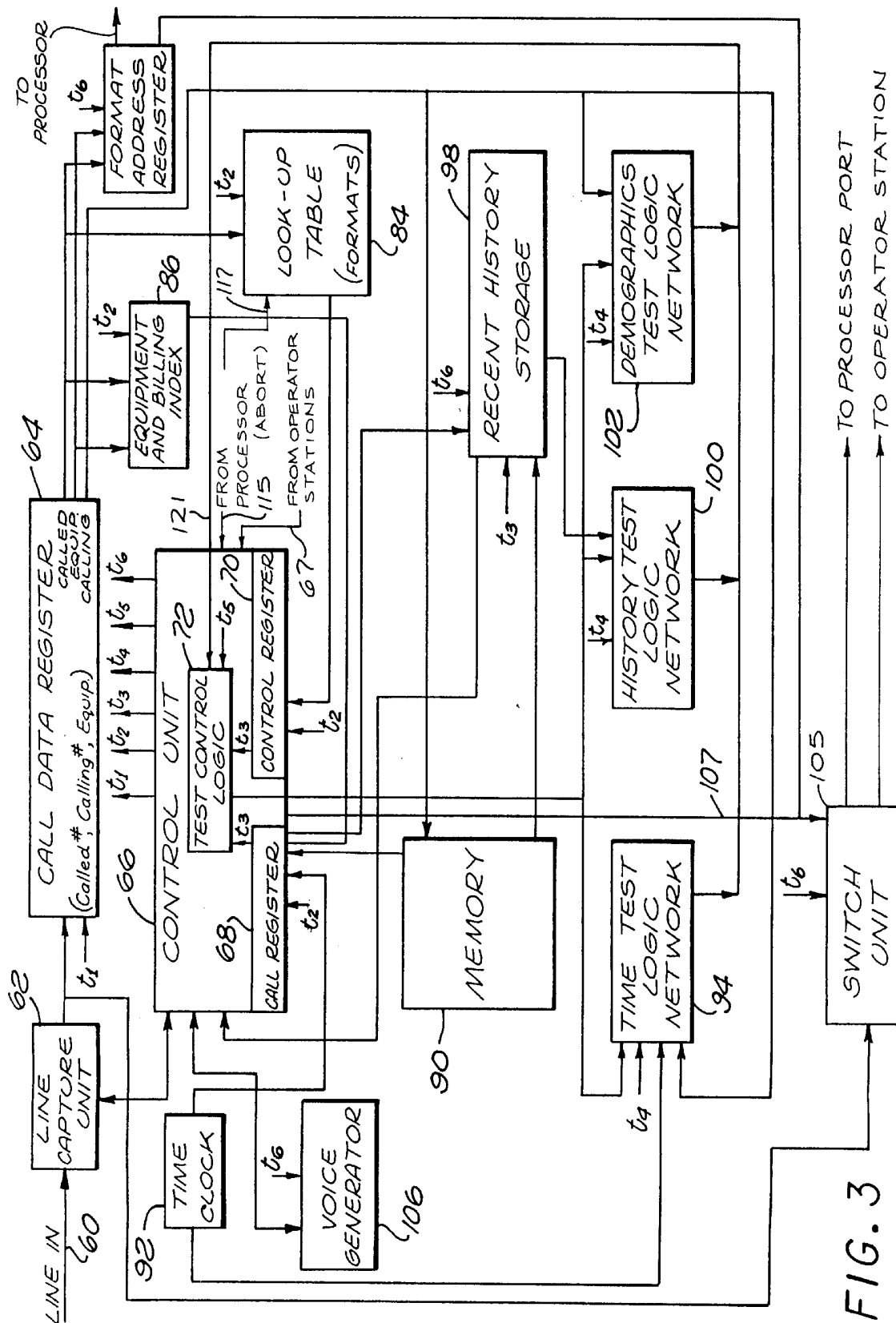


FIG. 3

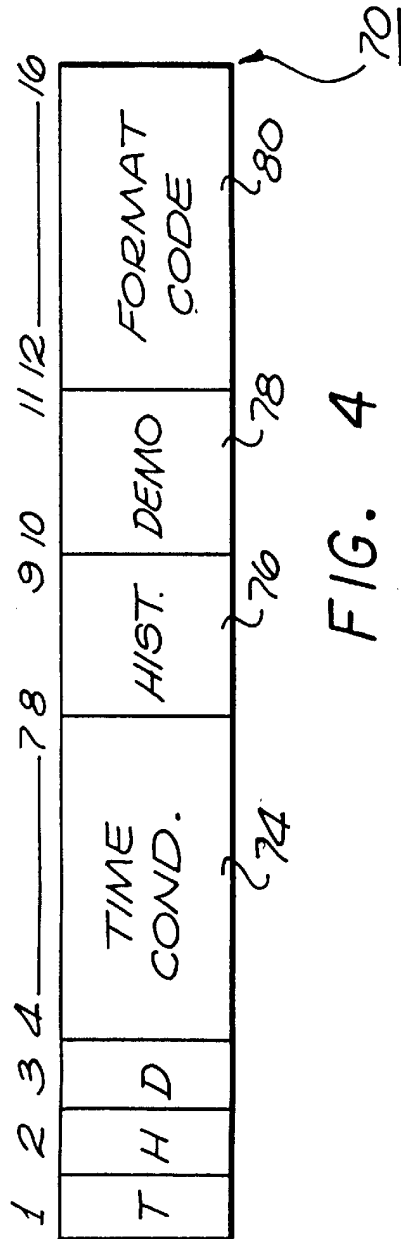
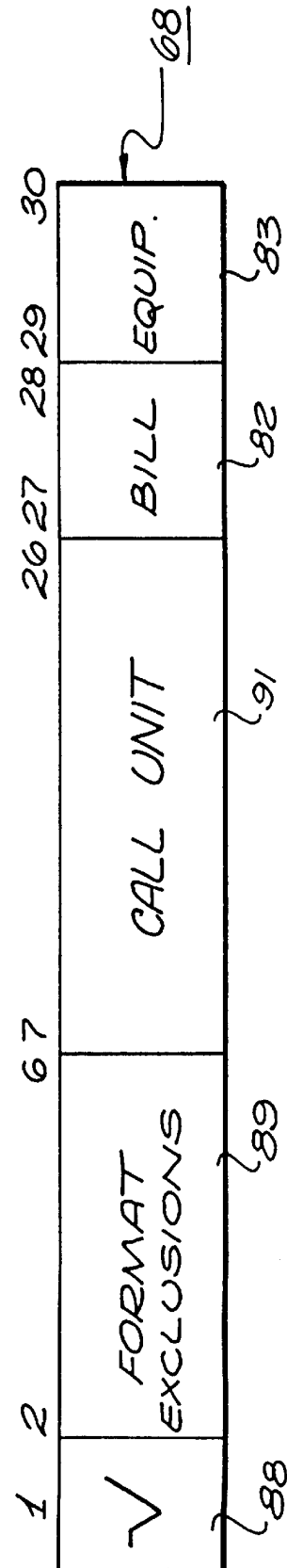


FIG. 5



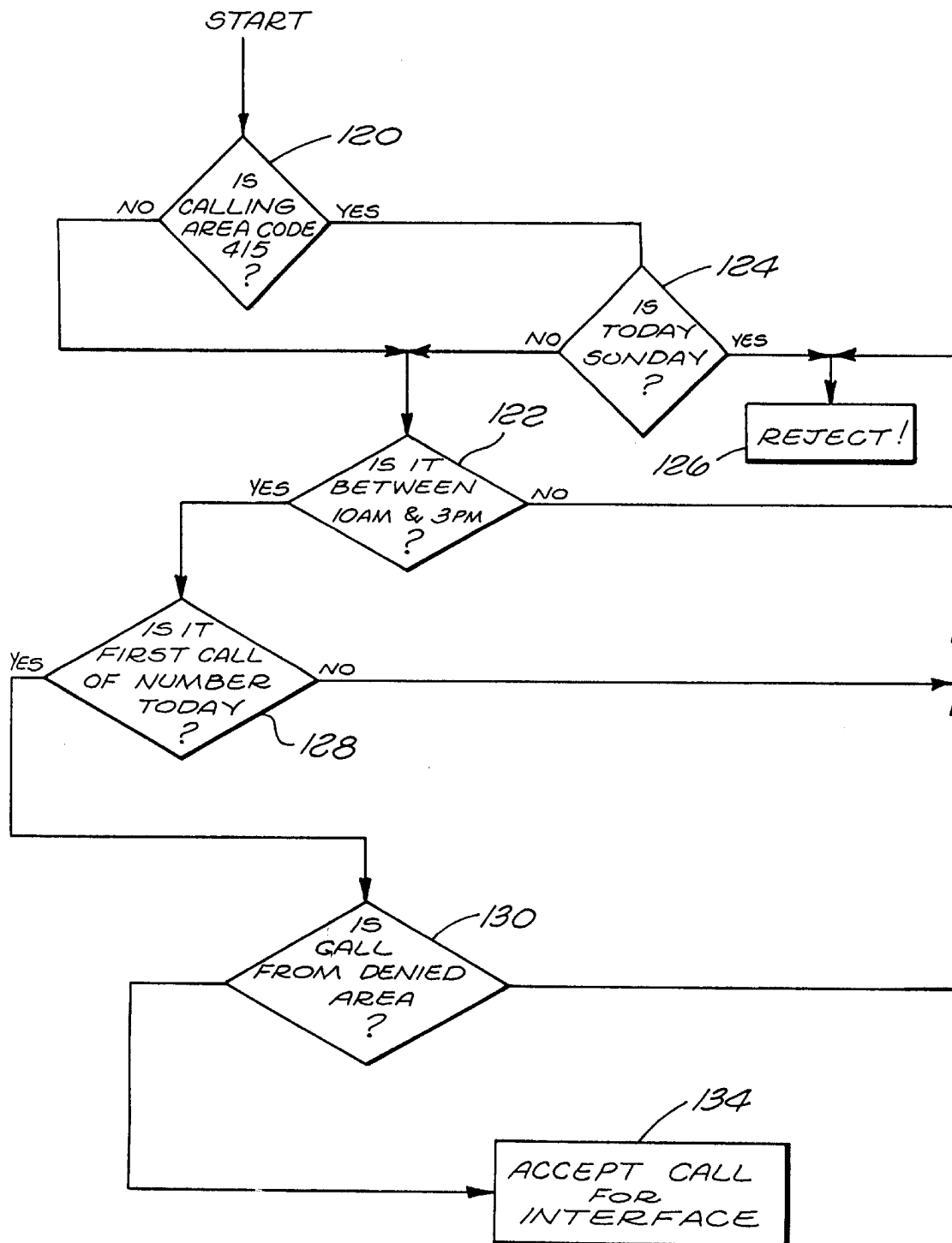


FIG. 6

5,917,893

1

**MULTIPLE FORMAT TELEPHONIC
INTERFACE CONTROL SYSTEM****RELATED SUBJECT MATTER**

This is a continuation of application Ser. No. 08/306,751, filed Sep. 14, 1994, and entitled "Multiple Format Telephonic Interface Control System", which is a continuation of application Ser. No. 08/047,241 filed Apr. 13, 1993 and entitled "Multiple Format Telephonic Interface Control System", now U.S. Pat. No. 5,351,285, which is a continuation of application Ser. No. 07/509,691 filed Apr. 16, 1990 and entitled "Multiple Format Telephonic Interface Control System", now abandoned, which is a continuation-in-part of application Ser. No. 260,104 filed Oct. 20, 1988 and entitled "Telephonic Interface Control System", now U.S. Pat. No. 4,930,150, which is a continuation-in-part of application Ser. No. 018,244 filed Feb. 24, 1987 and entitled "Statistical Analysis System For Use With Public Communication Facility", now U.S. Pat. No. 4,792,968, which was a continuation-in-part of application Ser. No. 753,299 filed Jul. 10, 1985 and entitled "Statistical Analysis System For Use With Public Communication Facility", now abandoned. Also, this application is a continuation-in-part of application Ser. No. 07/640,337 filed Jan. 11, 1991, and entitled "Telephonic-Interface Statistical Analysis System", now abandoned, which is a continuation of application Ser. No. 07/335,923 filed Apr. 10, 1989, and entitled "Telephonic-Interface Statistical Analysis System", which is a continuation of application Ser. No. 07/194,258 filed May 16, 1988, and entitled "Telephonic-Interface Statistical Analysis System", now U.S. Pat. No. 4,845,739, which is a continuation-in-part of application Ser. No. 018,244 filed Feb. 24, 1987 and entitled "Statistical Analysis System For Use With Public Communication Facility", now U.S. Pat. No. 4,792,968, which is a continuation-in-part of application Ser. No. 753,299 filed Jul. 10, 1985, and entitled "Statistical Analysis System For Use With Public Communication Facility", now abandoned.

**BACKGROUND AND SUMMARY OF THE
INVENTION**

Over the past several years, substantial expansion has occurred in the technology of combining telephonic and computer systems. For example, telephone systems have been developed to readily transmit digital data. Various forms of modems are in wide-spread use to intercouple telephones and computers. However, at a more personal level, it also has been proposed to utilize the traditional dialing buttons of telephone instruments to provide digital data, as for various processing. In accordance with such arrangements, voice messages prompt callers to provide data by actuating the alphanumeric buttons of conventional telephones. These systems have been proposed in association with computers to provide various services and one such system is disclosed in U.S. Pat. No. 4,792,968, issued Dec. 20, 1988, to Ronald A. Katz from an application Ser. No. 018,244 filed Feb. 24, 1987.

With respect to telephonic computer systems, attaining the interface format desired by an individual caller is sometimes complex and burdensome. Specifically, callers may be misdirected, screening may be ineffective and delays may be cumbersome. Also, records may be poor or non-existent. Furthermore, some situations exist where interface to a live operator is an important alternative. As a consequence, a need exists for an improved interface system for selectively interfacing a considerable number of individual callers with

2

a multiple format processor, as to attain efficient and economical digital and vocal exchanges along with prompting and data accumulation.

In general, the present invention comprises a telephonic-computer interface system accommodating digital and vocal (analog) telephonic communication and capable of handling a large number of calls to selectively interface prompted live-operator stations or formats in a computer processor. The selected interface is controlled, as by call (called number, calling number, etc.) and can be altered under control of an operator, developed data or operating conditions. Accordingly, the system of the present invention interfaces: (1) a telephonic communication facility including remote terminals for individual callers, e.g. conventional telephone instruments including voice communication means, and digital input means in the form of alphanumeric buttons for providing data and (2) either a prompted live-operator station or a multiple port, multiple format data processor for concurrently processing data from a substantial number of callers with respect to any of several formats.

The interface system incorporates a controller for receiving calls from remote terminals for association with ports in the telephonic computer apparatus, and which receives signal-represented call data (representing "calling" and "called" telephone numbers) along with equipment information. An index apparatus is controlled, as by the signal-represented call data, to select initially a live-operator or machine format of the processor so as to specify any conditions for the interface, at least one of the formats including at least one condition. A test apparatus may determine whether or not an individual call attains specified conditions and thereby controls switching structure for providing the actual interface. If a live-operator terminal is selected, or indicated as a secondary format, prompt data is provided to a select station. Data is recorded and processing procedures also may be controlled by call data.

BRIEF DESCRIPTION OF THE DRAWINGS

In the drawings, which constitute a part of this specification, an exemplary embodiment exhibiting various objectives and features hereof is set forth, specifically:

FIG. 1 is a block diagram of a system constructed in accordance with the present invention;

FIG. 2 is a flow diagram illustrating the operating process of the system of FIG. 1;

FIG. 3 is a block diagram of a component portion of the system of FIG. 1;

FIG. 4 is a diagrammatic representation of a binary control word as registered and utilized in the system of FIG. 1;

FIG. 5 is a diagrammatic representation of a binary data record word as utilized and recorded in the system of FIG. 1; and

FIG. 6 is a flow diagram illustrating the operating process of the structure represented in FIG. 5.

**DESCRIPTION OF THE ILLUSTRATIVE
EMBODIMENT**

As required, a detailed illustrative embodiment of the present invention is disclosed herein. However, physical communication systems, data formats, and operating structures in accordance with the present invention may be embodied in a wide variety of forms, some of which may be quite different from those of the disclosed embodiment. Consequently, the specific structural and functional details

5,917,893

3

disclosed herein are merely representative; yet in that regard, they are deemed to afford the best embodiment for purposes of disclosure and to provide a basis for the claims herein which define the scope of the present invention.

Referring initially to FIG. 1, a series of remote terminals T1-Tn (telephone instruments) are represented (left). The terminals T1-Tn are generally similar and accordingly only the terminal T1 is shown in any detail. The indicated terminals T1-Tn represent the multitude of telephone terminals existing in association with a communication facility CO which may comprise a comprehensive public telephone network.

The communication facility CO, along with the individual terminals T1-Tn, is coupled to a central processing station CS generally indicated by a dashed-line block. Generally with regard to the station CS, individual terminals T1-Tn are interfaced either with a processor P (upper right) or one of several live-operator stations OS1-OSn (lower left) through a call receiver unit CU and a switch SW. Essentially, the processor P and the switch SW cooperate (line 9) to control interfaces, with the processor P providing interface formats either (or both) to automate an interface or prompt a live operator at a station OS1-OSn. Note that the interface formats are stored as described below in the processor P.

In accordance herewith, individual telephone calls are preliminarily processed on the basis of signal-represented call data to identify a specific operating format for a station or the processor P. The preliminary processing may invoke screening tests to impose conditions or establish a test criteria for the switch SW to determine the acceptability of the call to interface with a specific operating format.

Calls are selectively processed according to a specific operating format as indicated by call data. At any instant of time, the collective interface may involve several thousand calls simultaneously being processed through ports of the processor P. Exemplary selected formats of the processor might include: public polls, lotteries, auctions, promotions, sales operations and games. Accordingly, the stations OS1-OSn may comprise a substantial number and the processor P may take the form of a sizable computer capable of simultaneously processing many calls involving several different formats. Although numerous possible configurations are available, for purposes of explanation, the processor P is illustrated simply as a block with multiple ports. Note that while the switch SW and the processor P may be integrated in a single system, they are separately illustrated to isolate the detailed structure and process of the present invention.

Input lines LI1 through LI n from the call receiver unit CU enter the switch SW to provide calling data and communication paths. Output lines LO1 through LO n function between the switch SW and the processor P as lines LS1-LS n operate to serve the stations OS1-OSn. Note that various multiplexing techniques are well known in the telephonic art to communicate call data and may be employed in the system.

Considering the system somewhat summarily, individual calls originating at the terminals T1-Tn are coupled through the communication facility CO and the call receiver unit CU to the switch SW. Call data, representative of calls, actuates the switch SW to preliminarily process each call based on the desired format. For example, depending on the desired format (indicated by the called number and/or the equipment data signals) calls are selectively coupled and processed. Furthermore, record data is assembled for storage.

Considering the system of FIG. 1 in somewhat greater detail, the exemplary telephone terminal T1 includes a

4

handpiece 10 (microphone and earphone) and a panel 12 provided with a rectangular array of push buttons 14 in a conventional configuration. Of course, the handpiece 10 accommodates analog signals while the panel 12 is a digital apparatus. Generally, the handpiece 10 serves to manifest analog or voice signals to a caller.

In accordance with conventional telephone structure, alphabetic and numeric designations are provided on the buttons 14. For example, several of the buttons 14 carry three letters along with a decimal digit. Specifically, the button designated with the numeral "2" also carries the letters "A", "B" and "C". Thus, the buttons 14 encompass the numerals "0-9" two symbols, and the alphabet except for the letters "Q" and "Z". Consequently, the buttons 14 substantially accommodate the entry of decimal and alphabetic data.

At this stage, some specific aspects of the communication facility CO are noteworthy. Essentially, with telephonic dialing, the communication facility CO couples selective terminals (from the multitude of terminals T1-Tn) to the call receiver unit CU. In that regard, the unit CU at the central station CS may be reached by any of a plurality of called numbers. For example, the call unit CU might be reached by any of twenty telephone dialing numbers, each associated with a specific operating format of the processor P. One called number or set of numbers might be associated with an auction format of the processor P. Another number or set of numbers might be associated with sales operating formats. Still another called number or set of numbers might identify a game format, and so on.

Incoming calls to the call receiver unit CU are identified by call data in accordance with telephone system techniques. As described below, the call data may specifically include digital signals representative of the called number (DNIS), the calling number (ANI) (terminal number), and the terminal equipment.

In addition to attaining a preliminary interface with a selected format, individual calls may be screened based on the called number (identifying an operating format) and the calling number (caller identification) or the equipment. That is, the system of the present invention is based on a realization that signal-represented call data can be effectively utilized to selectively interface individual callers at remote terminals with specific operating formats of a data processor.

Considering the call data in somewhat greater detail, in accordance with current telephone systems, the communication facility CO may provide signal-represented call data for: the "called" number, the "calling" number, and the equipment involved, e.g. "pulse" or "tone" terminal. Specifically, operating telephone equipment termed "DNIS" automatically provides the called telephone number in digital form from the communication facility CO. Somewhat similarly, existing telephonic equipment designated "ANI" automatically indicates the caller's (calling) number in digital signal represented form. Generally, time shared lines carry such call data and also may provide call data indicating equipment. Thus, the call unit CU may receive the called number, the calling number, and a calling equipment designation (pulse or tone), collectively termed call data, which data is utilized to establish control functions, as for example to select an operating format for a station OS1-OSn or the processor P.

As described in detail below, call data is registered in the switch SW to perform distinct control operations. Specifically, a selection section 16 of the switch SW iden-

5,917,893

5

ties a specific desired format for the stations OS1–OSn or the processor P. Depending on the format, a testing section 18 of the switch SW may screen calls for interface connections.

Recognizing that the possibilities are great, formats for calls in accordance with the disclosed embodiment may be of three different classes. Specifically, call formats may specify any of the following operations:

1. couple to live operator station if possible or in accordance with a predetermined criteria; if no operator station available, couple to processor;
2. interface to processor;
3. either above format, but selectively re-couple to live operator station or processor depending on secondary conditions.

The ramifications of individual formats within the above classes may vary considerably; however, some examples will illustrate possibilities. A marketing format (class 1) might interface callers to a live operator if an operator is available. Upon receiving a call, the operator station OS1–OSn (FIG. 1) also receives and displays prompting format data for the attending operator. If an operator is not available (all stations OS1–OSn busy) the system provides an interface with the processor P and a format as to record the data for a return call by an operator. Alternatively, the processor completes the transaction with data provided by the caller that may be digital, digital and voice, or voice.

In a game format, say of class 2, a caller may be limited to interface the processor P. the interface may be contingent on initial test conditions, e.g. call data, caller record, time, etc.

Formats of class 3 involve a switch between live operator and processor depending on secondary conditions. For example, a polling format may switch from the processor P to an operator station OS1–OSn if the caller fails to provide digital data in a responsive form. Alternatively, an operator may command a switch to the processor P upon identifying a specific caller from whom data is to be taken.

In the illustrative system of FIG. 1, an operating process is executed as illustrated in FIG. 2. Each incoming call prompts a preliminary query as indicated by a block 20 concerning the availability of a line or port. In the absence of an available line, a busy signal is provided as indicated by the block 22. Alternatively, an available line results in a preliminary interconnect as indicated by a block 24 setting a conditional connection into operation.

As indicated by a block 26, during the screening or testing interval (typically measured in seconds or fractions of seconds) the caller remains on line and may receive a message. That is, the caller might hear silence or may continue to hear the traditional telephonic ringing sound. Alternatively, the caller might be given a brief vocal message to “stand by” as indicated by the block 26. In any event, the caller is held “on line” while the process continues.

With a call on a line, the communication facility CO (FIG. 1) provides signal-represented call data, e.g. the called number, the calling number, and the equipment designation. As indicated by block 28 (FIG. 2) signals representative of the call data are captured to perform preliminary control and processing operations as will now be considered. Note that the selected formats will fall within one of the classes as stated above.

The initial test is illustrated by a query block 25 representing an operation to distinguish calls of class 1 (operator) and class 2 (processor). Calls for a format seeking an operator prompt a “yes” response from the block 25 and proceed to the test of a block 27, “is an operator available?”

6

A “yes” determination advances the process to an operation indicated by a block 29. Specifically, the block 29 represents the operations of coupling a caller to an operator station and transferring the appropriate format data to the station for prompting the operator. If no operator is available (block 27) the process proceeds with automated control to attain an interface in accordance with an appropriate format. Specifically, a control word is fetched (block 36) to establish an operating format for interfacing the call. In that regard, the specified format may be very simple. For example, the call simply may be prompted to indicate identification for a return call. Alternatively, the format may incorporate conditions or other complications as explained below.

Returning to the query block 25, if the call is to be coupled to the processor, an initial test operation is indicated by a block 30. A validity test is performed, for example, a list of calling numbers may be compiled that are to be denied access to any interface with the processor P. Negative calling numbers may result either by the choice of the person responsible for the calling number terminal, or by the choice of the service operating the processor P (FIG. 1). For example, an accumulation of prior improper transactions from a terminal designated by a specific telephone number may provide a basis for complete disqualification. Equipment also may disqualify.

Recognizing that various circumstances may be involved with respect to the total disqualification of a calling terminal, in accordance herewith the test involves formulation of a validity bit as indicated by the query block 30. Acceptable calls set the validity bit at a binary “1”.

If the calling terminal is invalid, (“no” from the block 30) the call is rejected as indicated by the block 32 with or without a message and the line is released as indicated by the block 34. Note that the time interval involved is very short and the rejection message may take various forms including a verbal comment, a busy signal or simply a disconnected signal.

If a positive validity bit (“1”) is formed at the junction of the query block 30, a control word is fetched under command of the called number as indicated by the block 36. As described in detail below, a control word is available for each operating format of the processor P and is utilized to impose the conditions for an interface and the terms of any associated billing.

As indicated in FIG. 2, the fetched control word of the block 36 prompts an inquiry as to the conditions attendant the selected operating format as indicated by a query block 38. That is, in the process, the query of block 38 determines whether further conditions are imposed for attaining interface with the processor P. If no further conditions are imposed, the format is initiated by pursuing the connected interface as indicated by a block 40. Also, as indicated by a block 42, the call is logged or recorded as with respect to billing data for example.

If access to a format involves conditions (“yes” from the query block 38), tests are specified as illustrated by a block 44. That is, conditions for the interface are specified by the block 44. Of course, the specific tests may involve various criteria; however, in the illustrative embodiment, the conditions involve time, history and demographics. Each exemplary condition will now be considered somewhat preliminarily.

In the disclosed embodiment, time tests involve testing the time of the call against certain limitations. For example, it may be desirable to limit some formats to specific time intervals as in relation to a television broadcast, a real time auction and so on. Note that the time tests also may be

5,917,893

7

related to specific terminal control and geographic areas treated on the basis of telephone area codes. Specific examples will illustrate.

Assume an operating game format that propounds questions to a caller based on knowledge of a particular television program. The program may be broadcast at different times in different geographic areas, and as a consequence it may be desirable to limit calls interfacing the processor format depending on the area code of calling numbers. Accordingly, time tests may involve solely the instant time, or various combinations of time and call data. The specific test is determined as indicated by a block 46 (FIG. 2) imposing detailed operating instructions for the format. The test results are then correlated as represented by a block 48.

As indicated above, in accordance with the described embodiment, another test involves a record as for example directed to the station identified by the calling number. As an example, the record might take the form of either a negative or a positive file (for an individual format). In that regard, all formats involving "pay to dial" (e.g. 976, 900 etc.) calls might be conditioned as a group. Generally, in the case of a negative file, certain numbers are recorded that are to be denied access to a particular operating format. In the case of a positive file, access to the operating format is available only to calling numbers listed in the file.

Considering exemplary implementations of the system, a negative file may be based on limited or restricted use (as in the case of a lottery) or prohibitive use (telephone terminal owner choice). Formats accessible on a "one-time only" basis also may be controlled by negative lists. Thus, an operating format may be inaccessible to a terminal, or may be accessible a specified number of times during a specified interval, e.g. three accesses per week. The historical test is symbolized in FIG. 2 by the query block 50 to conditionally actuate the related tests as indicated in the block 48. History limitations also may involve purely format limits. For example, a give-away or dial-free format may be limited to some predetermined number of calls for a period, e.g. ten thousand calls per day. Thus, limits can be imposed on the economic exposure of a format.

Moving from the historic considerations, demographic tests may be specified as in relation to the geographic area manifest by the area code of the calling number. To consider a specific example, a public opinion poll may be conducted in which a particular geographic balance is defined. In such an operating format, calls may be accepted only until particular quotas are attained with respect to specified area codes. Such tests in the process are indicated by the query block 52, again to instruct the correlation block 48.

With the requisite tests established by selection of a format, the block 48 indicates resolving the acceptability of the call for the selected interface format. If the call is accepted, the process moves to initiate the selected format interface as indicated by the block 40. Conversely, if the call is to be rejected, the process moves to the step indicated by block 32, i.e. reject the call as with a message and release the line.

If a call is accepted, as represented by the block 40, there is a possibility that an established format may be aborted in favor of a different format. For example, interfacing the processor P, a qualified caller may fail to communicate digitally with the result that transfer to a live operator is commanded. Also, in certain situations, a connection to a live operator is to be terminated in favor of an interface to the processor. In either event, an existing format is terminated in favor of a fresh format. That phase of the process is illustrated by an "abort" line from the block 40 returning

8

to the block 28. Thus, the process returns to re-assign the caller to a new format in accordance with fresh data. Thus, transfers according to class 3 operation are implemented along with the other classes of operation by the switch SW (FIG. 1).

An exemplary detailed structure of the switch SW (FIG. 1) for executing the process of FIG. 2 is represented in FIG. 3. In that regard, individual telephone calls are manifest from the call receiver unit CU (FIG. 1) comprising existing equipment as well known in the prior art. The call data is supplied through a line 60, upper left, FIG. 3. Note that the represented single line 60 is merely symbolic of a channel to carry call data and provide direct telephone communication.

Generally, the system of FIG. 3 illustrates elements of the switch SW of FIG. 1 for processing an individual call. As indicated above, the system of the present invention involves the simultaneous processing of many calls with the possibility that numerous calls are simultaneously being tested for a connection as explained above. Consequently, although the system of FIG. 3 is illustrated with respect to testing a single call, it is to be understood that sequential or parallel operations and multiplexing techniques, as well known and widely practiced in the computer field, are utilized to accomplish multiple processing operations as are described below with reference to FIG. 3.

The line 60 (FIG. 3, upper left) enters a line capture unit 62 through which signal-represented call data is supplied to a call data register 64. Accordingly, the call data is registered to be available for processing operations as explained generally with reference to FIG. 2.

The line capture unit 62 also is connected to a control unit 66. Structurally, the control unit 66 may take the form of various computer facilities incorporating memory and logic capability to sequence and control specific functions as explained below. Generally, the control unit 66 implements specific formats which may involve coupling a caller either to a live operator station OS1-OSn or to the processor P. In that regard, the control unit 66 provides a series of timing signals t1-t6 to sequence the operations of individual component blocks as illustrated. Note that to preserve clarity in FIG. 1, connections of timing signals t1-t6 are not illustrated. Also, the control unit 66 is connected to the operator stations OS1-OSn (line 67) to receive signals indicative of the availability of stations.

In addition to logic for controlled switching as described, the control unit 66 specifically includes a call register 68, a control register 70 and test control logic 72. The control register 70 receives format control words specified, as by the called number and having a form as illustrated in FIG. 4.

Recapitulating, each of the operating formats has a control word for defining any access conditions or limitations to accomplish a specific format, e.g. connection to an operator station OS1-OSn or to the processor P (FIG. 1). The formats may vary considerably; however, a few examples are the following:

Class 1, connect the live operator if available and provide prompt data for the YYS Company telemarketing program, if operator not available, cue caller: "All operators are busy at the moment, but we will return your call as soon as possible. Please touch your telephone buttons '2' and '4' to identify yourself as twenty-four for the return call".

Class 2, couple qualified callers to computer P for polling interface.

Class 3, couple callers to computer P for the RST Company telemarketing program, however, transfer to live operator (and prompt) if caller is not responsive.

5,917,893

9

These formats are established by control words that are selected on the basis of call data. The control words are sixteen bits, illustrated as the first sixteen bits (1–16) registered as shown in FIG. 4. An additional group of registered bits (17–20) are provided from call data.

The initial three registered bits in the control register (FIG. 4) serve as test command bits respectively for a time test, a history test and a demographics test. The presence of a “1” bit in any of the first three bit locations specifies the requirement for testing compliance to specified conditions. A “0” bit indicates no test.

The bits “4 through 7” in the control register constitute a field 74 and specify time conditions in relation to the instant time of the call. The field 74 may specify eight distinct time conditions. For example, exemplary specified conditions for a format might be as follows:

Accept calls between 7:00 and 18:00,

Accept calls on Thursday between 9:00 and 10:00,

Accept calls from area code 213 on Wednesday between 15:00 and 16:00,

Accept calls from area code 602 on Wednesday between 16:00 and 17:00.

Essentially, the time condition field 74 (activated by the time bit “1”—first bit position) defines specific intervals during which calls will be accepted for the specific called number and may be further limited by the area codes. A wide range of possibilities are available to accommodate specific programs for individual formats.

A field 76 in the control register embraces bits “8” and “9” and defines the conditions for access to the format based on historical considerations. Thus, two bits are provided to indicate four possible historical limitations. Again, the test is specified by a “1” bit, in this instance in the second bit location of the register 70. The following limitations are exemplary of many possibilities as related to a single telephone number:

Accept one call per day (per caller),

Accept one call per week (per caller),

Accept one call per month (per caller),

Accept one call during any three-day period (per caller),

Accept only 10,000 calls (per format).

continuing with respect to the contents of the register 70, as illustrated in FIG. 4, bits “10” and “11” constitute a field 78 specifying demographic test limitations. Again, a few examples will illustrate the various possibilities:

Accept calls only from area code 213,

Accept calls from area codes 213, 818 and 619,

Accept only 1,000 calls from area code 213,

Accept calls from area code 213 with the prefix numerals 619.

Again, the demographic test is imposed only upon the existence of a “1” bit, in this instance in the third bit of the control word. As in the other cases, specific possibilities are considerable.

The bits “12” through “16” of the control word constitute a field 80 and designate a selection code for the identified format. These five bits enable a substantial number of formats to be designated and coded with respect to various classifications. For example, calls of the class 1 specifying a desirable connection to a live operator station OS1–OSn might be encoded in a “000” decimal series, e.g. “001” indicates XYZ Company telemarketing program, “034” indicates RST Company program, and so on. Accordingly, a “0” in the most significant digit specifies a live operator format. Similarly, lottery formats might be encoded in a

10

“100” decimal series, e.g. “101, 102, 103- - - 110, 111, 112”- - - and so on; auctions might be designated in a “200” series, e.g.: “201, 202, - - -”. By using decimal equivalent coding formats for various categories, exclusions may be concisely stated. For example, a calling number may be excluded from all lottery operating formats simply by the specification of decimal “100” in association with the calling number.

The data, as illustrated in FIG. 4 is loaded into the control register 70. Again, the first sixteen bits comprise the format control word and are provided from a look-up table 84 (FIG. 3, right, central) upon being addressed by call data from the register 64.

The last bits (bits 17–20) stored in the control register 70 are provided from an equipment and billing instruction index 86. That is, in response to the signal-represented call data indicating the called number and the equipment, the look-up table 84 and the index 86 supply data for loading the control register as indicated above.

While the control register 70 is loaded to specify the operation of the system, the call register 68 in the control unit 66 receives signals for additional control and to formulate a record of the call. Specifically, as represented in FIG. 5, the contents of the call register 68 includes an initial validity bit 88 for indicating that the calling number is either on a positive list or is not on a negative list. The determination of the validity bit for location 88 is made by reference to a memory 90 (FIG. 3, central) addressed by the calling number.

While the calling number addresses data to indicate a validity bit, specific format exclusions also may be indicated as explained above with respect to certain formats. For example, certain classifications of formats or specific formats (as a lottery) may be identified as inaccessible for certain telephone terminals as identified by calling numbers. Other than lottery formats, certain discretionary formats also may initiate control to limit access. Accordingly, a field 89 in the call register 68 (FIG. 5, bits “2” through “6”) is provided from the memory 90, addressed by the calling number to specify format exclusions. That is, the calling number addresses the memory 90 to load the field 89 and specify limitations. Consider a few examples of format exclusions or limitations for a calling number:

No lottery formats,

One lottery format per week,

Two lottery formats per month of total cost under \$25.00,

No auction sales,

Auction sales only with caller entered code I.D. 763.

Again, it will be apparent that many possibilities exist in applying various coding techniques, the above merely being exemplary. Also, as indicated above, a format may be void of any limitations or restrictions. In that event, as explained above, a connection or interface is promptly commanded by the format code.

The bits “7” through “26” stored in the call register 68 (FIG. 5) constitute a field 91 and indicate the time of a call. Signals representative of the instant time of a call to load the field 90 are provided from a time clock 92 (FIG. 3, upper left). Signals from the time clock 92 may be in a Julian code and are provided to the call register 68 and also to a time test logic network 94 (lower left).

The last bits (27–30) in the register 68 are provided from the call data. The bits “27” and “28” indicate format billing data and comprise a field 82. Again, representations are coded; however, with respect to the field 82 information is derived from the called number. For example, an “800”

5,917,893

11

called number may indicate no billing with the representative code being stored in the field **82**. As another possibility, a "976" prefix number, or "900" number, may indicate a specific charge in relation to the identified format.

The bits "29" and "30" comprise a field **83** and may actuate a special form of the selected format. In the disclosed embodiment, the field **83** registers call data, as to indicate that the calling terminal is a "pulse" (rotary dial) signal unit or a "tone" (touch) signal unit. In the instance of a rotary terminal, the format program may be modified to accommodate "pulse" signal operation or inject operator communication with a transfer to one of the stations OS1-OSn.

Recapitulating to some extent with regard to the composition of the call record word in the register **68** (FIG. 5), the memory **90** (FIG. 3) is addressed by calling number data to provide data for the validity bit location **88** and the format-exclusion field **89**. The time of call is stored in the field **91** from the clock **92**. The billing and equipment data are provided by the index **86** in response to "calling" data signals.

Another element of memory, specifically, a recent activity storage **98** (FIG. 3, lower right) is separately illustrated for convenience of explanation. Essentially, the storage **98** receives words from the call register **63** to maintain a record of interface calls. The recent activity storage may periodically be purged to permanent storage if desired. Thus, the recent activity storage **98** accumulates an activity record of all interface participants with respect to specific formats and is utilized in the history test for determining that an instant calling terminal is within the specified historical limitations as provided from the memory **90**.

The activity tests are performed by a history test logic network **100** (FIG. 3, lower central). In a related context, the demographics test as explained in detail above is performed by a demographics test logic network **102**. The results of the test logic networks are communicated to the test logic **72** in the control unit **66**. As a consequence, a switch unit **105** is actuated to either operatively couple the line **60** into a port of the processor P (FIG. 1) or reject the call. If a call is accepted for an interface, a signal is supplied from the test control logic **72** through a line **107** to the switch **105** during the interval of the timing signal T6. The signal in the line **107** also is supplied to a format address register **109** for addressing the processor P. The register **109** stores select data signals to address a specific operating format of the processor P.

Recapitulating to some extent, call data indicates an interface format of the processor P (FIG. 1) with associated limitations, conditions and billing provisions. Call data also indicates possible format limitations or conditions for a calling, number. The system processes the data with respect to the conditions and limitations to selectively enable interface operations. Essentially, the call data specifies a format (processor or operator) and any conditions relating to the format. Representative data accordingly is provided from the look-up table **84** and the memory **90** to the control register **70** and the call register **68** respectfully. Preliminary conditions may or may not be involved; however, qualified calls for an operator involve tests of availability within the control unit **66** according to data received from the stations OS1-OSn (line **67**). As a result, calls are either interfaced to an operator who receives a format prompt, or interfaced to the processor according to a specified format. Thereafter, a shift may command a redetermination and a transfer as described in detail below.

In view of the above structural and logic description of the system of FIG. 3, the process as described with respect to

12

FIG. 2 and the stored control word forms as described with respect to FIGS. 4 and 5, a comprehensive understanding of the described embodiment may now best be accomplished by assuming an exemplary call and treating the individual responsive steps. Accordingly, assume the occurrence of a call as manifest on the line **60** (FIG. 3, upper left). Further, assume that the called number, "976 513 7777" designates a lottery format with limited access. Details of the limited access will be treated below.

Upon occurrence of the call, the line capture unit **62** seizes a line relationship and signals the control unit **66**. Immediately, an interval of time signal t1 is initiated and the register **64** is loaded with the called number ("900 513 7777"), the calling number ("415 318 4444") and the equipment designation (tone or no tone). To the caller, the operations as now described involve an almost imperceptible delay.

During the following interval of timing signal t2, the call register **68** and the control register **70** are loaded as illustrated respectively in FIGS. 4 and 5. Specifically, the called number and equipment designation specify data to load the control register **70**. The calling number ("415 318 4444") from the register **64**, prompts the memory **90** to load the validity bit **88** and the format exclusions in the field **89** of the register **68**. Concurrently, the time clock **92** loads the field **91** with signals representative of the current time.

If the call register **68** does not receive a validity "1" bit, the calling number is indicated to be barred with a consequence that the line is released by the control unit **66**. In that regard, a voice generator **106** (FIG. 3, left central) may be actuated by the control unit **66** branching to the operation of timing signal t6. Accordingly, a message of denial may be provided on the line **60** prior to release of the line. Note that the voice generator **106** may be variously used to prompt or inform callers in certain preliminary selection operations supplemental to the specific operations disclosed below.

As indicated above, concurrently with the loading of the call register **68** (timing signal t2), the control register **70** also is loaded. Specifically, from the register **64**, the called number cues the look-up table **84** to fill most of the control register (bits "1" through "16", FIG. 4). The fields **82** and **83** are supplied from the index **86**.

That is, distinct from the fields loaded into the control register **70** from the look-up table **84**, the fields **82** and **83** are supplied from the index **86**. In that regard, assume the called number (area code 976) indicates that the charge for the service of the call will be billed through the caller's telephone records. Assume that the field **83** indicates a "tone" terminal effective for a conventional digital interface.

At this point, some still further assumptions will be made to pursue the explanation of the detailed operations. Specifically, assume that the format specified by the called number ("900 513 7777") is a lottery format and includes limitations with respect to time, history and demographics. Accordingly, the initial three bits of the control word all will be "1" bits in the control register **70**.

Assume further that the time conditions specified by the field **74** (FIG. 4) limit calls from area code 415 to days other than Sunday. Assume that the history field **76** of the control word imposes a limitation of one call per day per calling station. Assume that the demographics field **78** excludes any call from area codes "512", "412", "812", - - - (not "415"). Finally, assume the selected format (field **80**) designates a specific lottery format, that is lottery "128".

In addition to registration of the data sets detailed above, because a history test is specified, the recent history storage **98** is cued during the interval of timing signal t3. The

5,917,893

13

operation is through the memory **90** by the control unit **66** to prompt the supply of historical data (previously registered record words) for the telephone terminal designated by the calling number ("415 318 4444"). Specifically, during the interval of timing signal **t3**, the storage **98** supplies data on the calling number to the history test logic network **100**. Such data is compiled into a test format as to indicate the number of calls per day, per week, and so on. Note that aggregate call totals may also be supplied as a test criteria. Thus, the control unit **66** coordinates the test criteria data preparatory to the test operations of the individual logic networks **94**, **100** and **102**.

To summarize, in accordance with the above assumptions, the test control logic **72** is set up to coordinate the following specific logic tests:

Time limitation test by network **94**: accept calls from area code 415 except on Sunday,

History limit test by network **100**: accept only one call per day per station,

Demographics test by network **102**: accept no calls from area codes 512, 412, 812 - - (415 not listed).

As explained above, in addition to the limitations specified, in relation to the format, further limitations may be specified by the calling number. Such limitations are specified by the field **89** in the register **68** (FIGS. **3** and **5**). In the instant example, assume that according to the record word, participation in the lottery format is limited to the interval between 10:00 a.m. and 3:00 p.m., e.g. when minors are in school. The code for such a format is supplied during the interval of timing signal **t3** from the field **89** of the call register **68** to further establish the set-up of the logic **94** acting through the test control logic **72**.

Recapitulating with regard to the test control logic **72**, essentially a program is defined imposing each of the limitations that are specified by the call data in sufficient detail that comparison tests are expediently performed by the networks **94**, **100** and **102**. It is stressed, as indicated above, that the tests are selectively performed only in the event a "1" bit appears in the representative first three bit locations of the control word format. In the illustrative example, all the tests were commanded and accordingly the test control logic **72** sets up the condition for tests to be performed by the networks **94**, **100** and **102**, all during the interval of timing signal **t3**. Of course, the specific example represents one possibility of a substantial number of programs that might be specified to the system.

With the test formats established in the test control logic **72**, the logic networks **94**, **100** and **102** are driven during the interval of test signal **t4** to execute a program in accordance with the assumed example. The process may be variously implemented in logic using well known techniques and is detailed in FIG. **6**. Consider the time test of the network **94**. The time test logic network **94** approves an interface only if: the call is not from area code "415" on a Sunday and furthermore the call occurs between the hours of 10:00 a.m. and 3:00 p.m. As indicated in FIG. **6**, a decision block **120** resolves the area-code "415" time test. If the area code is not "415", the logic proceeds to the next query block **122**. Alternatively, if the area code is "415", the day must be tested against Sunday as indicated by the query block **124**. An affirmative indication from the Sunday test of block **124** prompts a rejection as indicated by the block **126**.

If the Sunday test of block **124** is passed, the program imposes another time test, that is the time-of-day test as indicated by the block **122**. Again, a negative result prompts a rejection; however, a positive result involves the next step as indicated by the block **128**.

14

Note that the operations designated by query blocks **120**, **122** and **124** are performed by the time test logic network **94** (FIG. **3**). The next test of the block **128** is performed by the history test logic **100**. The block **128** (FIG. **6**) involves a determination of whether or not the instant call is the first for the calling terminal on the instant calendar day. If not, the limitations are exceeded and the call is rejected. If the test is passed, the process next involves the demographic test logic network **102** (FIG. **3**) to determine whether or not the call originated from an excluded area based on the calling number area code.

Area controls are illustrated by the query block **130** of FIG. **6**. Specifically, the demographics test logic network **102** determines whether or not the current call is from a denied area. If so, the call is rejected as indicated by the block **126**. Alternatively, if the area is not excluded, as illustrated by the block **134** in FIG. **6**, the interface is accepted. In the instant case, the area "415" is acceptable.

In the operation of the system as illustrated in FIG. **3**, the logic networks **94**, **100** and **102** indicate test results to the test control logic **72** during the interval of the timing signal **t5**. The logic **72** correlates the test result for action by the control unit **66**. If the imposed conditions are met (or if there are no conditions) the control unit **66** actuates the switch unit **105** and the address register **109** through the line **107** to perfect the interface from the line **60** (upper left) to either a port in the processor **P** (FIG. **1**) or one of the operator stations **OS1-OSn**. Essentially, the switching operation occurs during the interval of the timing signal **t6**. Concurrently, the address register **109** specifies the select operating format as stored in the processor **P** for direct use in an interface with a caller, or to be retrieved and supplied through the switch **SW** to prompt an operator at a station **OS1-OSn**.

Also during the interval of the timing signal **t6**, the contents of the call register **68** is stored in the recent history storage **98**. Note that billing data is stored with the call words and may be selectively extracted from the storage **98**. At the termination of the timing signal **t6**, the interface endures until there is a "disconnect" or an "abort".

If the processor **P** senses the existence of conditions specifying a shift between a processor interface and a live operator communication, the control unit **66** is actuated as indicated through line **115**. Note that the abort signal is formed either in response to predetermined conditions in an interface with the processor **P**, or on command from an active operator station. The signal is also supplied to the look-up table **84** which becomes active if a transfer is conditional. That is, if a transfer is conditional, the tests as described above may be invoked. Conversely, if the transfer is unconditional, the control unit **66** simply actuates the switch **105** to make the change and prompts the format address register to establish the desired format or prompt pattern for an operator.

The formats may involve various records, however, in accordance with the system of the present invention affords considerable flexibility to program individual conditions and limitations for each interface format based on the call data (calling number and called number). An interface may involve no conditions or conditions may be imposed from the called number (format selection), the calling number, or both. Accordingly, effective control may be imposed depending upon the service requested as manifest by an individual format, the instant time, the history of use and the demographics involved. The imposed limitations may be non-existent or may involve a relatively complex test pattern as explained in detail above.

5,917,893

15

In the disclosed embodiment, an effective record of calls is accumulated in the recent history storage 98. Thus, a composite and detailed record is accumulated of individual calls as executed.

It is to be appreciated that numerous formats may be implemented and controlled utilizing the principles of the system as illustrated above. Accordingly, it is to be understood that the system of the present invention should be interpreted in accordance with the claims as set forth below.

What is claimed is:

1. An interface control system for use with, (1) a communication facility including remote terminals for individual callers to make calls, wherein said remote terminals comprise a telephone capability including voice communication means and some of said remote terminals comprise digital input means for providing data, (2) a multiple port, multiple format processor for concurrently processing data from a substantial number of callers in any one of a plurality of formats, said communication facility automatically providing call data signals, as to indicate called data (DNIS), to select a specific format from said plurality of formats, and (3) a plurality of live operator attended terminals, for a plurality of formats, said interface control system comprising:

call data means for receiving call data signals from said communication facility for a calling remote terminal indicative of calling number identification signals automatically provided by said communication facility and call data signals to indicate called data (DNIS) to select a specific format from said plurality of formats;

interface means for providing automated voice messages relating to said specific format to certain of said individual callers, wherein said certain of said individual callers digitally enter data, including at least caller information data, through said digital input means;

means for directly forwarding, under control of said specific format, a call coupled to said interface means from any one of said remote terminals to one of said plurality of live operator attended terminals for inputting of caller identification data and caller information data when said remote terminals do not have capability to digitally provide data;

qualification means coupled to said live operator attended terminals for controlling access by at least certain of said callers to at least a portion of said system, said qualification being based at least in part on caller identification data entered through said digital input means by at least certain of said callers having digital input means and at said live operator attended terminal when said remote terminals do not have capability to digitally provide data,

means for processing coupled to said live operator attended terminals for processing caller information data entered by an operator at said live operator attended terminal; and

means for storing coupled to said interface means and said processing means for storing certain select data from said caller information data entered by said operator and data entered digitally by said individual callers to update records on said individual callers.

2. An interface control system according to claim 1, wherein said call data signals automatically provided from said communication facility for a calling remote terminal indicative of calling number identification signals are used to access a positive file of data with respect to said individual callers stored in said means for storing.

16

3. An interface control system according to claim 2, wherein said access is subject to a use history test.

4. An interface control system according to claim 1, wherein said call data signals automatically provided from said communication facility for a calling remote terminal indicative of calling number identification signals are used to access a negative file to test for prohibited use status with respect to individual callers.

5. An interface control system according to claim 1, wherein said calling number identification signals at least in part control processing of said data entered through said digital input means by said individual callers.

6. An interface control system according to claim 1, wherein said calling number identification signals are used to test for a limit on use with respect to said individual callers.

7. An interface control system according to claim 6, wherein said limit on use is a use history test.

8. An interface control system according to claim 7, wherein said use history test is based on a limited dollar amount.

9. An interface controls system according to claim 7, wherein said use history test is based on a limited dollar amount for a limited period of time.

10. An interface control system according to claim 7, wherein said use history test is based on a limited number of accesses.

11. An interface control system according to claim 7, wherein said use history test is based on a limited number of accesses during a limited period of time.

12. An interface control system according to claim 1, wherein said qualification means controls access at least in part based upon said call data signals.

13. An interface control system according to claim 12, wherein said call data signals include said calling number identification signals.

14. An interface control system according to claim 13, wherein said calling number identification signals include Automatic Number Identification (ANI).

15. An interface control system according to claim 1, wherein said qualification means controls access at least in part based upon said digitally entered data entered by said caller.

16. An interface control system according to claim 1, wherein said qualification means controls access at least in part based upon data entered by an operator.

17. An interface control system according to claim 16, wherein said data entered by an operator is subject to a use history test.

18. An interface control system according to claim 17, wherein said use history test is based on a limited dollar amount.

19. An interface controls system according to claim 17, wherein said use history test is based on a limited dollar amount for a limited period of time.

20. An interface control system according to claim 17, wherein said use history test is based on a limited number of accesses.

21. An interface control system according to claim 17, wherein said use history test is based on a limited number of accesses during a limited period of time.

22. An interface control system according to claim 1, wherein said means for storing further receives and stores said calling number identification signals.

23. An interface control system according to claim 22, wherein said calling number identification signals control at least a part of the operation of the system.

5,917,893

17

24. An interface control system according to claim 1, further including means for transferring certain of said calls from said live operators to an automated system to receive processed data via a voice generator.

25. An interface control system according to claim 1, wherein said qualification means controls access at least in part based upon said digitally entered data entered by said caller when said remote terminals do have capability to digitally provide data and upon said data entered by said operator when said remote terminals do not have capability to digitally provide data.

26. An interface control system according to claim 25, wherein said qualification means controls access for a predetermined period of time.

27. An interface control system according to claim 25, further including means for transferring certain of said calls from said line operators to the interface means to receive processed data via a voice generator.

28. An interface control system according to claim 25, wherein said calling number identification signals control at least in part the processing of data.

29. An interface control system according to claim 28, wherein said control includes a use history test.

30. An interface control system according to claim 29, wherein said use history test includes a dollar limit.

31. An interface control system according to claim 29, wherein said use history test includes a dollar limit and a limit to a predetermined period of time.

32. An interface control system according to claim 1, wherein said plurality of formats includes a plurality of sales formats.

33. An interface control system for use with, (1) a communication facility including remote terminals for individual callers to make calls, wherein said remote terminals comprise a telephone capability including voice communication means and some of said remote terminals comprise digital input means for providing data, (2) a multiple port, multiple format processor for concurrently processing data from a substantial number of callers in any of a plurality of formats, said communication facility automatically providing call data signals, as to indicate called data (DNIS), to select a specific format from said plurality of formats, and (3) a plurality of live operator attended terminals, for a plurality of formats, said interface control system comprising:

interface means for receiving calling number identification signals and called data (DNIS) signals automatically provided from said communication facility, and for providing automated voice messages relating to a specific format to certain of said individual callers, wherein said certain of said individual callers digitally enter data through said digital input means;

means for directly forwarding a call coupled to said interface means from any one of said remote terminals to one of said plurality of live operator attended terminals under control of said call data signals when said remote terminals do not have capability to digitally provide data;

qualification means coupled to said live operator attended terminals for controlling access by at least certain of said callers to at least a portion of said system, said qualification being based at least in part on caller identification data entered through said digital input means by at least certain of said callers having digital input means and at said live operator attended terminal when said remote terminals do not have capability to digitally provide data,

18

means for processing coupled to said live operator attended terminals for processing caller information data entered by an operator at said live operator attended terminal; and

means for storing coupled to said interface means and said processing means for storing certain select data from said caller information data entered by said operator and data entered digitally by said individual callers to update records on said individual callers.

34. An interface control system according to claim 33, wherein said calling number identification signals are used to access a positive file of data relating to said individual callers.

35. An interface control system according to claim 34, wherein said system further includes a use history test for said individual callers.

36. An interface control system according to claim 35, wherein said use history test is based on dollar amount.

37. An interface control system according to claim 35, wherein said use history test is based on number of uses.

38. An interface control system according to claim 33, wherein said calling number identification signals are used to access a negative file and test for prohibited use status relating to said individual callers.

39. An interface control system according to claim 33, wherein said calling number identification signals at least in part control processing of said data entered through said digital input means by said certain individual callers.

40. An interface control system according to claim 33, wherein said calling number identification signals are used to test for a limit on use with respect to said individual callers.

41. An interface control system according to claim 40, wherein said limit on use is based on time.

42. An interface control system according to claim 40, wherein said limit on use includes a use history test.

43. An interface control system according to claim 42, wherein said use history test limits based on dollar amount.

44. An interface control system according to claim 43, wherein said use history test limits based on a dollar amount for a predetermined period of time.

45. An interface control system according to claim 42, wherein said use history test limits based on number of uses.

46. An interface control system according to claim 45, wherein said use history test limits based on a number of uses during a predetermined period of time.

47. An interface control system according to claim 33, wherein said qualification means controls at least in part based upon said digitally entered data entered by said caller when said remote terminals do have capability to digitally provide data and upon data entered by an operator when said remote terminals do not have the capability to digitally provide data.

48. An interface control system according to claim 33, wherein said calling number identification signals control at least in part the processing of said data.

49. An interface control system according to claim 33, wherein said qualification means controls access for a dollar amount for a predetermined period of time.

50. An interface control system according to claim 33, wherein said plurality of formats includes a plurality of sales formats.

51. An interface control system according to claim 33, wherein said qualification means controls access at least in part based upon said call data signals.

52. An interface control system according to claim 51, wherein said call data signals include said calling number identification signals.

5,917,893

19

53. An interface control system according to claim 52, wherein said calling number identification signals include Automatic Number Identification (ANI).

54. An interface control system according to claim 33, wherein said qualification means controls access at least in part based upon said digitally entered data entered by said caller.

55. An interface control system according to claim 33, wherein said qualification means controls access at least in part based upon data entered by an operator.

56. An interface control system according to claim 33, wherein said means for storing stores said calling number identification signals.

57. An interface control system according to claim 33, wherein said calling number identification signals control at least a part of the operation of the system.

58. An interface control system according to claim 33, further including means for transferring certain of said calls from said live operators to the interface means to receive processed data via a voice generator.

59. An interface and process control system of a multiple port, multiple format processor for concurrently processing data from a substantial number of callers in one of a plurality of formats for use with a telephonic communication facility including remote terminals for individual callers, wherein said remote terminals comprise a telephone capability including voice communication means and digital input means for providing data, said interface and process control system comprising:

call data means for receiving signal-represented call data from said remote terminals indicative of called number identification signals (DNIS) automatically provided by said telephonic communication facility;

selection means coupled to said call data means for selecting a select data format from said plurality of formats under control of said signal-represented call data indicative of called DNIS, said select data format having an imposed condition to execute certain operations of said select data format, one of said formats having an imposed condition for verifying an instant call from a remote terminal against a file to limit or prevent access in accordance with said DNIS signals to said one format from callers listed on said file and at least one of said plurality of formats having an imposed condition with respect to time in accordance with said DNIS signals;

test means coupled to said selection means for testing said imposed condition to provide approval signals; and processing means coupled to said test means for executing certain operations of said select format under control of said approval signals.

60. An interface control system according to claim 59, wherein said file is a negative file and wherein said call data means also receives calling number identification signals automatically provided by said telephonic communication facility, which are used to access said file.

61. An interface control system according to claim 60, wherein said negative file limits access based on a use history test.

62. An interface control system according to claim 61, wherein said use history test is a dollar test.

63. An interface control system according to claim 62, wherein said use history test is a dollar test for a predetermined period of time.

64. An interface control system according to claim 61, wherein said use history test is based on the number of accesses.

20

65. An interface control system according to claim 64, wherein said use history test is based on the number of accesses for a predetermined period of time.

66. An interface and process control system according to claim 59, wherein said processing means performs certain preliminary processing operations before testing of said imposed condition.

67. An interface control system according to claim 59, wherein said plurality of formats includes a plurality of sales formats.

68. An interface control system for use with, (1) a communication facility including remote terminals for individual callers to make calls, wherein said remote terminals comprise a telephonic instrument including voice communication means and some of said remote terminals comprise digital input means for providing data, and (2) a multiple port, multiple format processor for concurrently processing data from a substantial number of callers in any of a plurality of formats, said communication facility automatically providing call data signals, as to indicate called data (DNIS), to select a particular format from said plurality of formats, and (3) a plurality of live operator attended terminals, for a plurality of formats, said interface control system comprising:

call data means for receiving signal-represented call data from said remote terminals indicative of called number identification signals (DNIS) automatically provided by said telephonic communication facility;

interface means for providing automated voice messages relating to a specific format to certain of said individual callers, wherein said certain of said individual callers digitally enter data through said digital input means; means for directly forwarding certain of said calls coupled to said interface means from any one of said remote terminals to one of said plurality of live operator attended terminals under control of said call data signals when necessary;

qualification means for controlling access by at least certain of said callers to at least a portion of said system,

means for processing coupled to said live operator attended terminals for processing caller information data entered by an operator at said live operator attended terminal; and

means for transferring certain of said calls from said live operators to said interface means to receive processed data via a voice generator.

69. An interface control system according to claim 68, wherein said call data means further receives calling number identification signals automatically provided by said telephonic communication facility.

70. An interface control system according to claim 69, wherein said means for processing controls processing of said caller information data based at least in part on said calling number identification signals.

71. An interface control system according to claim 69, wherein said qualification means operates at least in part on said calling number identification signals.

72. An interface control system according to claim 71, wherein said system further includes a use history test for said individual callers.

73. An interface control system according to claim 72, wherein said use history test is based on dollar amount.

74. An interface control system according to claim 72, wherein said use history test is based on number of uses.

75. An interface control system according to claim 74, wherein said use history test is based on the number of accesses for a predetermined period of time.

5,917,893

21

76. An interface control system according to claim **68**, wherein said means for processing also processes said data entered by said certain of said individual callers through said digital input means to control certain operations based on a limit on use.

77. An interface control system according to claim **76**, wherein said system further includes a use history test for said individual callers.

78. An interface control system according to claim **77**, wherein said use history test is based on dollar amount.

79. An interface control system according to claim **78**, wherein said use history test is a dollar test for a predetermined period of time.

80. An interface control system according to claim **77**, wherein said use history test is based on number of uses.

81. An interface control system according to claim **80**, wherein said use history test is based on a number of uses for a predetermined period of time.

82. An interface control system according to claim **68**, wherein said plurality of formats includes a plurality of sales formats.

83. An interface control system according to claim **68**, wherein said qualification means controls access at least in part based upon said call data signals.

22

84. An interface control system according to claim **83**, wherein said call data signals include said calling number identification signals.

85. An interface control system according to claim **84**, wherein said calling number identification signals include Automatic Number Identification (ANI).

86. An interface control system according to claim **68**, wherein said qualification means controls access at least in part based upon said digitally entered data entered by said caller.

87. An interface control system according to claim **68**, wherein said qualification means controls access at least in part based upon data entered by an operator.

88. An interface control system according to claim **68**, wherein said means for storing stores said calling number identification signals.

89. An interface control system according to claim **88**, wherein said calling number identification signals control at least a part of the operation of the system.

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